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ASYMPTOTISCHE LÖSUNGEN  
IM RESTRINGIERTEN DREIKÖRPER-  
PROBLEM (PROBLÈME RESTREINT)

VON

ELIS STRÖMGREN

MIT 1 TAFEL



KØBENHAVN

HOVEDKOMMISSIONÆR: ANDR. FRED. HØST & SØN, KGL. HOF-BOGHANDEL

BIANCO LUNOS BOGTRYKKERI

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In der Publikation 47 der Kopenhagener Sternwarte (Auszug aus der Seeliger-Festschrift; Springer, Berlin 1924) habe ich eine Untersuchung über einfach-periodische asymptotische Lösungen im problème restreint veröffentlicht. Die damals gegebenen Resultate machen einen Teil einer umfassenden Rechenarbeit über das System von unendlich vielen Bahnen aus, die zu den Librationspunkten  $L_4$  und  $L_5$  asymptotisch verlaufen.

Die in der erwähnten Publ. No. 47 veröffentlichten Resultate haben nachher zu einer Untersuchung über Klassen periodischer Bahnen Anlass gegeben, welche die dort mitgeteilten periodisch-asymptotischen Bahnen zu Grenzbahnen haben. Aus diesen Untersuchungen, die teilweise (Vier Bahnklassen im problème restreint, von JENS P. MÖLLER, A. N. 5574 und Publ. der Kop. Sternwarte No. 60) schon veröffentlicht, teilweise noch unpubliziert sind, geht hervor, dass eine ganze Reihe Klassen periodischer Bahnen existieren, die von den in der Publ. 47 mitgeteilten fünf periodisch-asymptotischen Bahnen I, II, III, IV und V<sup>1</sup> je zwei in allen möglichen Kombinationen zusammen genommen, begrenzt sind — ausser den in der Publ. 47 schon erwähnten Klassen, die je eine der existierenden einfach-periodischen

<sup>1</sup> Die Vermutung (Publ. 47, p. 12 und »Ergebnisse der exakten Naturwissenschaften« Bd. IV. p. 239), dass zwischen den periodischen Bahnen IV und V noch eine 6:ste einfach-periodische asymptotische Bahn existieren sollte, hat sich nicht bestätigt.

asymptotischen Bahnen zur Grenzbahn haben (I = Klasse  $k_1$ , II = Klasse  $k_2$ , III und IV = »Pseudolibrationen« und V = Klasse I). Nachdem diese Resultate erhalten sind, stehen die fünf einfach-periodischen asymptotischen Bahnen als das Gerüst zu dem weitaus grössten Teil der Klassen einfach-periodischer Bahnen im problème restreint dar.

Der Zweck der jetzt vorliegenden Arbeit ist, die — bisher unpublizierten — Gesamtergebnisse der numerischen Rechnungen über Bahnen, die zu den Librationspunkten  $L_4$  und  $L_5$  asymptotisch verlaufen, mitzuteilen.

Die Hauptpunkte der Theorie und der bei der numerischen Rechnung angewandten Methode sind in der Publ. 47, p. 7—9 gegeben (s. auch A. N. 4015). Die Berechnungsmethode ist eine gemischte: sie fängt mit der Anwendung der Gesetze der infinitesimalen Bewegung in der Nähe des Librationpunktes  $L_4$  an und setzt bei einem passend gewählten Zeitpunkt mit numerischer Integration fort.

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Wir stellen uns zunächst ein bewegliches Koordinatensystem  $(\xi, \eta)$  vor, wo der Anfangspunkt mit dem gemeinsamen Schwerpunkt der zwei gleich grossen endlichen Massen zusammenfällt. Die numerische Integration fängt immer in einem Punkte auf der  $\eta$ -Achse an ( $\xi$  also = 0); dieser Punkt ist durch den Anfangswert von  $\eta$  ( $\eta_0$ ) eindeutig bestimmt. Es sind 25 Bahnen gerechnet worden, von denen 21 in der beigelegten Tafel eingezeichnet sind; vier Bahnen (No. 6, 10, 21 und 23) sind auf dieser Tafel weggelassen worden, weil sie bei dem angewandten Maassstabe mit vier der gezeichneten Bahnen zusammenfallen würden oder wenigstens schwer von ihnen getrennt werden könnten. Auf der Tafel sind die fünf periodischen Bahnen durch Pfeile besonders hervorgehoben, und auch dadurch,

dass die zugehörigen  $\eta_0$ -Werte bei diesen Pfeilen wiederholt sind.

Wir bezeichnen mit  $x, y$  die Koordinaten in dem beweglichen Koordinatensystem mit Anfangspunkt in  $L_4$  (also:  $x = \xi, y = \eta - \sqrt{3}$ ).

Für einen gegebenen Anfangswert  $\eta_0$  erhält man für die Ingangsetzung der numerischen Integration die Anfangswerte der Geschwindigkeitskomponenten  $\left(\frac{dx}{dt}\right)_0$  und  $\left(\frac{dy}{dt}\right)_0$  mit Hilfe der Anfangsgeschwindigkeit  $V_0$  und des — für jede Bewegung, die auf der  $y$ -Achse ( $\eta$ -Achse) anfängt, gleichen — Winkels  $\theta$  ( $= 57^\circ 42' 25$ ), den die Anfangsbewegung mit der  $x$ -Achse macht:

$$\begin{aligned}\left(\frac{dx}{dt}\right)_0 &= V_0 \cos \theta \\ \left(\frac{dy}{dt}\right)_0 &= V_0 \sin \theta.\end{aligned}\tag{1}$$

Einen Ausdruck für  $V_0$  erhalten wir mit Hilfe des Jacobischen Integrals der Bewegungsgleichungen.

In dem beweglichen Koordinatensystem mit Anfangspunkt im Schwerpunkt des Systems lauten die Bewegungsgleichungen in dem Kopenhagener Problem ( $m_1 = m_2$ ) und in den bei unseren Arbeiten gewählten Einheiten:

$$\begin{aligned}\frac{d^2 \xi}{dt^2} - 2 \frac{d\eta}{dt} &= \xi - 4 \left( \frac{\xi - 1}{r_1^3} + \frac{\xi + 1}{r_2^3} \right) \\ \frac{d^2 \eta}{dt^2} + 2 \frac{d\xi}{dt} &= \eta - 4 \left( \frac{\eta}{r_1^3} + \frac{\eta}{r_2^3} \right),\end{aligned}\tag{2}$$

$$\begin{aligned}\text{wo } r_1^2 &= (\xi - 1)^2 + \eta^2 \\ r_2^2 &= (\xi + 1)^2 + \eta^2.\end{aligned}$$

Das Jacobische Integral lautet:

$$V^2 = \left(\frac{d\xi}{dt}\right)^2 + \left(\frac{d\eta}{dt}\right)^2 = \xi^2 + \eta^2 + 8 \left( \frac{1}{r_1} + \frac{1}{r_2} \right) - K, \tag{3}$$

wo  $K$  die Integrationskonstante bedeutet.

Den Wert von  $K$  im vorliegenden Problem finden wir, wenn wir  $\xi = 0$ ,  $\eta = \sqrt{3}$ ,  $r_1 = r_2 = 2$  und  $V = 0$  setzen, was dem Anfangszustand der asymptotischen Bewegung ( $t = -\infty$ ) entspricht.

Wir erhalten:

$$K = 11.$$

Für die Geschwindigkeit  $V_0$  in einem Punkte  $\xi = 0$ ,  $\eta = \eta_0$  auf der  $\eta$ -Achse ergibt sich dann:

$$V_0^2 = \eta_0^2 + \frac{16}{\sqrt{1 + \eta_0^2}} - 11, \quad (4)$$

woraus wir für jeden beliebigen Wert von  $\eta_0$  den zugehörigen Wert von  $V_0$  berechnen können.

Für eine Anzahl Werte von  $\eta_0$  in der Nähe von  $\sqrt{3}$  ( $= 1.732\,0508 \dots$ ) haben wir die folgende kleine Tafel berechnet, die das ganze zur Anwendung kommende Gebiet ausfüllt:

| $\eta_0$ | $V_0$          | $f'$       | $f''$  |
|----------|----------------|------------|--------|
| + 1.700  | — 0.048 1874.0 | + 7 5319.8 | — 54.1 |
| 1.705    | 0.040 6554.2   | 7 5265.7   | 54.0   |
| 1.710    | 0.033 1288.5   | 7 5211.7   | 54.2   |
| 1.715    | 0.025 6076.8   | 7 5157.5   | 54.1   |
| 1.720    | 0.018 0919.3   | 7 5103.4   | 54.2   |
| 1.725    | 0.010 5815.9   | 7 5049.2   | 54.1   |
| 1.730    | — 0.003 0766.7 | 7 4995.1   | 54.1   |
| 1.735    | + 0.004 4228.4 | 7 4941.0   | 54.1   |
| 1.740    | 0.011 9169.4   | 7 4886.9   | 54.1   |
| 1.745    | 0.019 4056.3   | 7 4832.8   | 54.1   |
| 1.750    | 0.026 8889.1   | 7 4778.7   | — 54.2 |
| 1.755    | 0.034 3667.8   | + 7 4724.5 |        |
| + 1.760  | + 0.041 8392.3 |            |        |

Die Theorie des vorliegenden Problem es soll an anderer Stelle ausführlich auseinandergesetzt werden. Hier kommt es ausschliesslich auf die numerischen Resultate an.

Die Rechnung fing naturgemäss immer in  $\xi, \eta$  an. In allen Fällen, wo die dritte, unendlich kleine, Masse in die Nähe einer der endlichen Massen kommt, wurde die Rechnung in den Thieleschen Koordinaten  $E, F$  fortgesetzt. Die zugehörigen  $\xi, \eta$ -Werte wurden nachträglich aus diesen  $E, F$ -Werten berechnet (bei dieser Umrechnung tritt in den  $\xi, \eta$  in einigen Fällen eine — unvermeidliche — Unsicherheit in der letzten Stelle auf).

In bezug auf die Genauigkeit der erlangten numerischen Resultate ist folgendes zu bemerken. Der Umstand, dass die Bahnrechnung in dem vorliegenden Problem für eine bedeutend grössere Anzahl Intervalle ausgeführt werden musste, als sonst im allgemeinen in unseren Arbeiten nötig ist, hat selbstverständlich auf die Genauigkeit am Schluss der Rechnung einen gewissen — übrigens wohl ziemlich unbedeutenden — Einfluss. Etwas mehr besagt es wohl, dass das erste Stück der Bahnen nach der infinitesimalen — also nicht ganz exakten — Formeln berechnet ist (über die zur Verfügung stehenden Mittel, sich gegen merkbare Fehler zu schützen, s. Publ. 47, p. 9 die Bemerkung über die Sätze 4, 5 und 6). Ich habe mich doch immer bemüht, durch Streichung der letzten Stelle die Unsicherheit der gegebenen Resultate zu beheben. Für das wesentliche der vorliegenden Untersuchung — den Nachweis der verschiedenen Klassen und Typen von Bahnen — spielt eine eventuell noch übrigbleibende kleine Unsicherheit in den Einzelergebnissen gar keine Rolle.

Es ist zu bemerken, dass die Werte von  $\eta_0$  bei den vier ersten als periodisch angegebenen Bahnen der exakten

Periodizität nicht ganz entsprechen, weil wir aus Rücksicht auf die in diesem Problem so wie so ausserordentlich umfassende Rechenarbeit darauf verzichten mussten, die Rechnungsgenauigkeit durch wiederholte Interpolation und wiederholte neue Bahnrechnung noch weiter zu treiben. In keinem Falle wird wohl die Unsicherheit in  $\eta_0$   $1\frac{1}{2}$  Einheiten der vierten Dezimalstelle übersteigen.

An der Organisation der Rechenarbeit hat Herr Assistent JENS P. MØLLER teilgenommen. Für Ausführung der Rechenarbeit und sonstige Hilfe habe ich den Herren: Oberlehrer BENNEDSEN (Helsingør), Dr. BURMEISTER (München), Assistent JOHANNSEN (Kopenhagen), Admiral KORSKOFF (Kopenhagen), Aktuar LØKKEGAARD (Kopenhagen), Dr. NOTEBOOM (Rathenow), Dr. SCHÜTTE (Frankfurt a/M), Dr. STAMMHAMMER (München), Dr. STOBBE (Neubabelsberg), Magister B. STRÖMGREN, ferner Frl. Dr. GÜSSOW (Neubabelsberg) und Frl. MACKEPRANG (Kopenhagen) herzlichst zu danken. Dem Carlsbergfond bin ich für wirksame pekuniäre Unterstützung zur Ausführung der numerischen Rechenarbeit zu grossem Dank verpflichtet.

*Observatorium, Kopenhagen, Febr. 1929.*

ELIS STRÖMGREN.

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## Bahn 1.

$$\eta_0 = +1.720$$

| $t$ | $\xi$     | $\eta$    | $t$  | $\xi$     | $\eta$    |
|-----|-----------|-----------|------|-----------|-----------|
| 0.0 | 0.00000   | + 1.72000 | 5.2  | + 0.39695 | + 1.71782 |
| 0.2 | - 0.00345 | 1.71816   | 5.4  | 0.41986   | 1.64962   |
| 0.4 | 0.00768   | 1.71661   | 5.6  | 0.42465   | 1.56657   |
| 0.6 | 0.01268   | 1.71551   |      |           |           |
| 0.8 | 0.01838   | 1.71507   | 5.7  | 0.41858   | 1.51935   |
| 1.0 | 0.02465   | 1.71550   | 5.8  | 0.40595   | 1.46829   |
| 1.2 | 0.03129   | 1.71704   | 5.9  | 0.38608   | 1.41337   |
| 1.4 | 0.03799   | 1.71989   | 6.0  | 0.35826   | 1.35459   |
| 1.6 | 0.04441   | 1.72429   | 6.1  | 0.32181   | 1.29200   |
| 1.8 | 0.05005   | 1.73042   | 6.2  | 0.27604   | 1.22572   |
| 2.0 | 0.05437   | 1.73841   | 6.3  | 0.22023   | 1.15600   |
| 2.2 | 0.05672   | 1.74833   | 6.4  | 0.15357   | 1.08328   |
| 2.4 | 0.05640   | 1.76012   | 6.5  | + 0.07498 | 1.00828   |
| 2.6 | 0.05268   | 1.77364   | 6.6  | - 0.01707 | 0.93206   |
| 2.8 | 0.04480   | 1.78856   | 6.7  | 0.12502   | 0.85585   |
| 3.0 | 0.03205   | 1.80440   | 6.8  | 0.25271   | 0.78073   |
| 3.2 | - 0.01381 | 1.82048   |      |           |           |
| 3.4 | + 0.01036 | 1.83588   | 6.70 | 0.12502   | 0.85585   |
| 3.6 | 0.04071   | 1.84950   | 6.75 | 0.18616   | 0.81811   |
| 3.8 | 0.07712   | 1.86004   | 6.80 | 0.25271   | 0.78073   |
| 4.0 | 0.11912   | 1.86603   | 6.85 | 0.32574   | 0.74363   |
| 4.2 | 0.16578   | 1.86587   | 6.90 | 0.40619   | 0.70655   |
| 4.4 | 0.21563   | 1.85794   | 6.95 | 0.49535   | 0.66884   |
| 4.6 | 0.26664   | 1.84060   | 7.00 | 0.59480   | 0.62922   |
| 4.8 | 0.31616   | 1.81232   | 7.05 | - 0.70634 | + 0.58526 |
| 5.0 | + 0.36089 | + 1.77177 |      |           |           |

| $t$  | $\xi$    | $\eta$   | $t$  | $\xi$    | $\eta$   |
|------|----------|----------|------|----------|----------|
| 7.00 | —0.59480 | +0.62922 | 7.18 | —1.06187 | +0.40626 |
| 7.02 | 0.63786  | 0.61234  | 7.20 | 1.12225  | 0.36056  |
| 7.04 | 0.68299  | 0.59457  | 7.22 | 1.18112  | 0.30695  |
| 7.06 | 0.73031  | 0.57560  | 7.24 | 1.23603  | 0.24499  |
| 7.08 | 0.77993  | 0.55505  | 7.26 | 1.28420  | 0.17533  |
| 7.10 | 0.83193  | 0.53243  | 7.28 | 1.32340  | 0.10002  |
| 7.12 | 0.88633  | 0.50712  | 7.30 | 1.35272  | +0.02198 |
| 7.14 | 0.94304  | 0.47834  | 7.32 | —1.37271 | —0.05595 |
| 7.16 | —1.00176 | +0.44510 |      |          |          |

## Bahn 2.

$$\eta_0 = +1.719$$

| $t$ | $\xi$    | $\eta$   | $t$ | $\xi$    | $\eta$   |
|-----|----------|----------|-----|----------|----------|
| 0.0 | 0.00000  | +1.71900 | 1.8 | —0.05428 | +1.73028 |
| 0.1 | —0.00176 | 1.71798  | 1.9 | 0.05684  | 1.73435  |
| 0.2 | 0.00374  | 1.71700  | 2.0 | 0.05897  | 1.73894  |
| 0.3 | 0.00592  | 1.71611  | 2.1 | 0.06056  | 1.74405  |
| 0.4 | 0.00833  | 1.71532  | 2.2 | 0.06153  | 1.74969  |
| 0.5 | 0.01094  | 1.71465  | 2.3 | 0.06178  | 1.75584  |
| 0.6 | 0.01376  | 1.71413  | 2.4 | 0.06120  | 1.76249  |
| 0.7 | 0.01676  | 1.71378  | 2.5 | 0.05970  | 1.76961  |
| 0.8 | 0.01994  | 1.71365  | 2.6 | 0.05718  | 1.77716  |
| 0.9 | 0.02328  | 1.71375  | 2.7 | 0.05352  | 1.78509  |
| 1.0 | 0.02674  | 1.71412  | 2.8 | 0.04864  | 1.79335  |
| 1.1 | 0.03030  | 1.71478  | 2.9 | 0.04243  | 1.80186  |
| 1.2 | 0.03393  | 1.71578  | 3.0 | 0.03481  | 1.81054  |
| 1.3 | 0.03758  | 1.71713  | 3.1 | 0.02570  | 1.81928  |
| 1.4 | 0.04121  | 1.71887  | 3.2 | 0.01504  | 1.82797  |
| 1.5 | 0.04475  | 1.72103  | 3.3 | —0.00276 | 1.83648  |
| 1.6 | 0.04816  | 1.72364  | 3.4 | +0.01118 | 1.84466  |
| 1.7 | —0.05136 | +1.72671 | 3.5 | +0.02678 | +1.85236 |

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 3.6 | + 0.04406 | + 1.85941 | 5.1 | + 0.41112 | + 1.74781 |
| 3.7 | 0.06299   | 1.86562   | 5.2 | 0.42904   | 1.71682   |
| 3.8 | 0.08351   | 1.87080   | 5.3 | 0.44340   | 1.68198   |
| 3.9 | 0.10556   | 1.87475   | 5.4 | 0.45353   | 1.64322   |
| 4.0 | 0.12900   | 1.87725   | 5.5 | 0.45875   | 1.60045   |
| 4.1 | 0.15372   | 1.87808   | 5.6 | 0.45834   | 1.55360   |
| 4.2 | 0.17951   | 1.87702   | 5.7 | 0.45156   | 1.50260   |
| 4.3 | 0.20617   | 1.87386   | 5.8 | 0.43767   | 1.44740   |
| 4.4 | 0.23344   | 1.86837   | 5.9 | 0.41593   | 1.38793   |
| 4.5 | 0.26102   | 1.86034   | 6.0 | 0.38560   | 1.32414   |
| 4.6 | 0.28857   | 1.84955   | 6.1 | 0.34597   | 1.25601   |
| 4.7 | 0.31571   | 1.83581   | 6.2 | 0.29632   | 1.18362   |
| 4.8 | 0.34202   | 1.81893   | 6.3 | 0.23593   | 1.10718   |
| 4.9 | 0.36704   | 1.79874   | 6.4 | 0.16394   | 1.02717   |
| 5.0 | + 0.39026 | + 1.77508 | 6.5 | + 0.07917 | + 0.94442 |

| $\psi$ | $\xi$     | $\eta$    | $E$       | $F$       |
|--------|-----------|-----------|-----------|-----------|
| 0.00   | + 0.29633 | + 1.18362 | + 1.38045 | — 1.01941 |
| 0.04   | 0.24040   | 1.11250   | 1.41055   | 0.96834   |
| 0.08   | 0.17944   | 1.04350   | 1.44683   | 0.91739   |
| 0.12   | 0.11410   | 0.97720   | 1.48923   | 0.86747   |
| 0.16   | + 0.04480 | 0.91376   | 1.53773   | 0.81944   |
| 0.20   | — 0.02849 | 0.85368   | 1.59247   | 0.77419   |
| 0.24   | 0.10601   | 0.79708   | 1.65367   | 0.73252   |
| 0.28   | 0.18806   | 0.74408   | 1.72163   | 0.69523   |
| 0.32   | 0.27508   | 0.69458   | 1.79673   | 0.66303   |
| 0.36   | 0.36741   | 0.64827   | 1.87944   | 0.63656   |
| 0.40   | 0.46508   | 0.60445   | 1.97019   | 0.61632   |
| 0.44   | 0.56768   | 0.56200   | 2.06935   | 0.60273   |
| 0.48   | 0.67419   | 0.51920   | 2.17723   | 0.59595   |
| 0.52   | 0.78268   | 0.47370   | 2.29388   | 0.59588   |
| 0.56   | — 0.89030 | + 0.42271 | + 2.41907 | — 0.60216 |

| $\psi$ | $\xi$     | $\eta$    | $E$       | $F$       |
|--------|-----------|-----------|-----------|-----------|
| 0.60   | — 0.99308 | + 0.36328 | + 2.55223 | — 0.61423 |
| 0.64   | 1.08627   | 0.29275   | 2.69234   | 0.63129   |
| 0.68   | 1.16469   | 0.20928   | 2.83791   | 0.65253   |
| 0.72   | 1.22351   | 0.11242   | 2.98703   | 0.67726   |
| 0.76   | 1.25909   | + 0.00324 | 3.13740   | 0.70514   |
| 0.80   | 1.27011   | — 0.11614 | 3.28644   | 0.73628   |
| 0.84   | 1.25768   | 0.24293   | 3.43144   | 0.77123   |
| 0.88   | 1.22571   | 0.37472   | 3.56959   | 0.81095   |
| 0.92   | 1.18000   | 0.50981   | 3.69814   | 0.85648   |
| 0.96   | 1.12790   | 0.64754   | 3.81438   | 0.90876   |
| 1.00   | 1.07735   | 0.78777   | 3.91566   | 0.96833   |
| 1.04   | 1.03707   | 0.93025   | 3.99924   | 1.03505   |
| 1.08   | 1.01640   | 1.07390   | 4.06230   | 1.10799   |
| 1.12   | 1.02537   | 1.21503   | 4.10187   | 1.18522   |
| 1.16   | 1.07480   | 1.34594   | 4.11492   | 1.26372   |
| 1.20   | 1.17408   | 1.45297   | 4.09884   | 1.33926   |
| 1.24   | 1.32664   | 1.51545   | 4.05228   | 1.40658   |
| 1.28   | 1.52311   | 1.50841   | 3.97609   | 1.45949   |
| 1.32   | 1.73536   | 1.41319   | 3.87500   | 1.49224   |
| 1.36   | — 1.9204  | — 1.2297  | + 3.7573  | — 1.5000  |

## Bahn 3.

$$\eta_0 = +1.716$$

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.0 | 0.00000   | + 1.71600 | 1.4 | — 0.05103 | + 1.71565 |
| 0.2 | — 0.00460 | 1.71353   | 1.6 | 0.05986   | 1.72152   |
| 0.4 | 0.01025   | 1.71143   | 1.8 | 0.06735   | 1.72973   |
| 0.6 | 0.01695   | 1.70993   | 2.0 | 0.07325   | 1.74045   |
| 0.8 | 0.02460   | 1.70931   | 2.2 | 0.07651   | 1.75377   |
| 1.0 | 0.03303   | 1.70985   | 2.4 | 0.07620   | 1.76963   |
| 1.2 | — 0.04197 | + 1.71186 | 2.6 | — 0.07128 | + 1.78784 |

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 2.8 | — 0.06078 | + 1.80795 | 4.0 | + 0.15859 | + 1.91181 |
| 3.0 | 0.04372   | 1.82930   | 4.2 | 0.22083   | 1.91146   |
| 3.2 | — 0.01929 | 1.85092   | 4.4 | 0.28720   | 1.90066   |
| 3.4 | + 0.01310 | 1.87161   | 4.6 | 0.35491   | 1.87740   |
| 3.6 | 0.05373   | 1.88987   | 4.8 | + 0.42042 | + 1.83964 |
| 3.8 | + 0.10246 | + 1.90382 |     |           |           |

| $\psi$ | $\xi$    | $\eta$   | $E$      | $F$      |
|--------|----------|----------|----------|----------|
| 0.00   | + 0.3548 | + 1.8774 | + 1.4050 | — 1.3996 |
| 0.05   | 0.4286   | 1.8332   | 1.3674   | 1.3848   |
| 0.10   | 0.4911   | 1.7713   | 1.3324   | 1.3615   |
| 0.15   | 0.5360   | 1.6931   | 1.3024   | 1.3289   |
| 0.20   | 0.5590   | 1.6020   | 1.2798   | 1.2867   |
| 0.25   | 0.5589   | 1.5020   | 1.2664   | 1.2353   |
| 0.30   | 0.5368   | 1.3970   | 1.2635   | 1.1756   |
| 0.35   | 0.4958   | 1.2904   | 1.2713   | 1.1089   |
| 0.40   | 0.4401   | 1.1845   | 1.2899   | 1.0368   |
| 0.45   | 0.3739   | 1.0808   | 1.3186   | 0.9611   |
| 0.50   | 0.3005   | 0.9804   | 1.3570   | 0.8837   |
| 0.55   | 0.2223   | 0.8842   | 1.4045   | 0.8063   |
| 0.60   | 0.1405   | 0.7928   | 1.4608   | 0.7308   |
| 0.65   | + 0.0551 | 0.7069   | 1.5258   | 0.6589   |
| 0.70   | — 0.0344 | 0.6270   | 1.6000   | 0.5920   |
| 0.75   | 0.1292   | 0.5535   | 1.6839   | 0.5316   |
| 0.80   | 0.2304   | 0.4868   | 1.7786   | 0.4790   |
| 0.85   | 0.3389   | 0.4272   | 1.8851   | 0.4353   |
| 0.90   | 0.4546   | 0.3738   | 2.0046   | 0.4011   |
| 0.95   | 0.5760   | 0.3254   | 2.1381   | 0.3768   |
| 1.00   | 0.6994   | 0.2795   | 2.2862   | 0.3623   |
| 1.05   | 0.8188   | 0.2326   | 2.4486   | 0.3565   |
| 1.10   | 0.9254   | 0.1807   | 2.6244   | 0.3577   |
| 1.15   | — 1.0091 | + 0.1206 | + 2.8112 | — 0.3636 |

| $\psi$ | $\xi$    | $\eta$   | $E$      | $F$      |
|--------|----------|----------|----------|----------|
| 1.20   | — 1.0601 | + 0.0516 | + 3.0055 | — 0.3720 |
| 1.25   | — 1.0716 | — 0.0240 | + 3.2030 | — 0.3815 |

Bahn 4.  
Periodische Bahn I.  
 $\eta_0 = +1.715$

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.0 | 0.00000   | + 1.71500 | 3.4 | + 0.01442 | + 1.87898 |
| 0.2 | — 0.00488 | 1.71238   | 3.6 | 0.05726   | 1.89805   |
| 0.4 | 0.01089   | 1.71017   | 3.8 | 0.10854   | 1.91267   |
| 0.6 | 0.01799   | 1.70862   | 4.0 | 0.16754   | 1.92076   |
| 0.8 | 0.02609   | 1.70799   | 4.2 | 0.23291   | 1.92014   |
| 1.0 | 0.03498   | 1.70861   | 4.4 | 0.30250   | 1.90855   |
| 1.2 | 0.04439   | 1.71079   | 4.6 | 0.37341   | 1.88384   |
| 1.4 | 0.05391   | 1.71484   | 4.8 | 0.44188   | 1.84404   |
| 1.6 | 0.06300   | 1.72108   | 5.0 | 0.50327   | 1.78746   |
| 1.8 | 0.07102   | 1.72977   | 5.2 | 0.55210   | 1.71271   |
| 2.0 | 0.07716   | 1.74110   | 5.4 | 0.58209   | 1.61870   |
| 2.2 | 0.08053   | 1.75515   | 5.6 | 0.58620   | 1.50433   |
| 2.4 | 0.08011   | 1.77188   | 5.8 | 0.55692   | 1.36818   |
| 2.6 | 0.07485   | 1.79106   | 6.0 | 0.48680   | 1.20789   |
| 2.8 | 0.06368   | 1.81221   | 6.2 | 0.3696    | 1.0203    |
| 3.0 | 0.04561   | 1.83462   | 6.4 | + 0.2009  | 0.8042    |
| 3.2 | — 0.01978 | + 1.85732 | 6.6 | — 0.0267  | + 0.5707  |

| $\psi$ | $\xi$     | $\eta$    | $E$       | $F$       |
|--------|-----------|-----------|-----------|-----------|
| 0.00   | + 0.48683 | + 1.20786 | + 1.26440 | — 1.05810 |
| 0.05   | 0.42333   | 1.10009   | 1.28865   | 0.98053   |
| 0.10   | + 0.35201 | + 0.99549 | + 1.32270 | — 0.90028 |

| $\psi$ | $\xi$     | $\eta$    | $E$       | $F$       |
|--------|-----------|-----------|-----------|-----------|
| 0.15   | + 0.27574 | + 0.89489 | + 1.36583 | — 0.81925 |
| 0.20   | 0.19627   | 0.79895   | 1.41756   | 0.73923   |
| 0.25   | 0.11411   | 0.70822   | 1.47767   | 0.66189   |
| 0.30   | + 0.02884 | 0.62321   | 1.54632   | 0.58878   |
| 0.35   | — 0.06061 | 0.54449   | 1.62404   | 0.52133   |
| 0.40   | 0.15561   | 0.47261   | 1.71169   | 0.46085   |
| 0.45   | 0.25733   | 0.40797   | 1.81034   | 0.40851   |
| 0.50   | 0.36644   | 0.35074   | 1.92121   | 0.36527   |
| 0.55   | 0.48244   | 0.30053   | 2.04547   | 0.33177   |
| 0.60   | 0.60305   | 0.25599   | 2.18404   | 0.30813   |
| 0.65   | 0.72381   | 0.21472   | 2.33733   | 0.29384   |
| 0.70   | 0.83756   | 0.17333   | 2.50493   | 0.28757   |
| 0.75   | 0.93503   | 0.12832   | 2.68534   | 0.28728   |
| 0.80   | 1.00591   | 0.07737   | 2.87588   | 0.29056   |
| 0.85   | 1.04145   | + 0.02062 | 3.07271   | 0.29532   |
| 0.90   | 1.03669   | — 0.03940 | 3.27119   | 0.30038   |
| 0.95   | 0.99240   | 0.09919   | 3.46643   | 0.30599   |
| 1.00   | 0.91435   | 0.15659   | 3.65490   | 0.31372   |
| 1.05   | — 0.81366 | — 0.21069 | + 3.82995 | — 0.32586 |

Bahn 5.  
Periodische Bahn II.

$$\eta_0 = + 1.711$$

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.0 | 0.00000   | + 1.71100 | 1.4 | — 0.06668 | + 1.71072 |
| 0.2 | — 0.00603 | 1.70778   | 1.6 | 0.07797   | 1.71842   |
| 0.4 | 0.01344   | 1.70505   | 1.8 | 0.08794   | 1.72914   |
| 0.6 | 0.02221   | 1.70312   | 2.0 | 0.09560   | 1.74314   |
| 0.8 | 0.03221   | 1.70234   | 2.2 | 0.09982   | 1.76052   |
| 1.0 | 0.04322   | 1.70308   | 2.4 | 0.09935   | 1.78121   |
| 1.2 | — 0.05487 | + 1.70573 | 2.6 | — 0.09290 | + 1.80491 |

| $t$ | $\xi$    | $\eta$   | $l$ | $\xi$    | $\eta$   |
|-----|----------|----------|-----|----------|----------|
| 2.8 | -0.07914 | +1.83106 | 4.8 | +0.53961 | +1.86891 |
| 3.0 | 0.05686  | 1.85873  | 4.9 | 0.57819  | 1.83710  |
| 3.2 | -0.02502 | 1.88670  | 5.0 | 0.61375  | 1.80008  |
| 3.4 | +0.01711 | 1.91335  | 5.1 | 0.64540  | 1.75767  |
| 3.6 | 0.06982  | 1.93668  | 5.2 | 0.67222  | 1.70973  |
| 3.8 | 0.13284  | 1.95442  | 5.3 | 0.69320  | 1.65611  |
| 4.0 | 0.20525  | 1.96403  | 5.4 | 0.70728  | 1.59665  |
| 4.2 | 0.28523  | 1.96287  | 5.5 | 0.71333  | 1.53117  |
|     |          |          | 5.6 | 0.71018  | 1.45942  |
| 4.3 | 0.32730  | 1.95741  | 5.7 | 0.69664  | 1.38101  |
| 4.4 | 0.37020  | 1.94826  | 5.8 | 0.67149  | 1.29541  |
| 4.5 | 0.41347  | 1.93512  | 5.9 | 0.63362  | 1.20181  |
| 4.6 | 0.45654  | 1.91769  | 6.0 | +0.58209 | +1.09912 |
| 4.7 | +0.49881 | +1.89570 |     |          |          |

| $\psi$ | $\xi$    | $\eta$   | $E$      | $F$      |
|--------|----------|----------|----------|----------|
| 0.00   | +0.58209 | +1.09912 | +1.18612 | -1.00684 |
| 0.05   | 0.51214  | 0.97912  | 1.20921  | 0.91411  |
| 0.10   | 0.43812  | 0.86350  | 1.24124  | 0.81821  |
| 0.15   | 0.36328  | 0.75240  | 1.28102  | 0.72103  |
| 0.20   | 0.28923  | 0.64607  | 1.32764  | 0.62431  |
| 0.25   | 0.21612  | 0.54467  | 1.38065  | 0.52957  |
| 0.30   | 0.14311  | 0.44847  | 1.44003  | 0.43818  |
| 0.35   | +0.06861 | 0.35789  | 1.50617  | 0.35136  |
| 0.40   | -0.00941 | 0.27359  | 1.57988  | 0.27029  |
| 0.45   | 0.09307  | 0.19649  | 1.66223  | 0.19606  |
| 0.50   | 0.18430  | 0.12792  | 1.75459  | 0.12975  |
| 0.55   | 0.28440  | 0.06948  | 1.85840  | 0.07240  |
| 0.60   | 0.39350  | +0.02281 | 1.97510  | -0.02481 |
| 0.65   | 0.51000  | -0.01067 | 2.10593  | +0.01248 |
| 0.70   | 0.62996  | 0.03070  | 2.25167  | 0.03955  |
| 0.75   | -0.74691 | -0.03814 | +2.41237 | +0.05722 |

| $\psi$ | $\xi$     | $\eta$    | $E$       | $F$       |
|--------|-----------|-----------|-----------|-----------|
| 0.80   | — 0.85208 | — 0.03538 | + 2.58708 | + 0.06715 |
| 0.85   | 0.93547   | 0.02577   | 2.77370   | 0.07164   |
| 0.90   | 0.98775   | — 0.01258 | 2.96887   | 0.07314   |
| 0.95   | 1.00235   | + 0.00196 | 3.16827   | 0.07347   |
| 1.00   | 0.97730   | 0.01636   | 3.36700   | 0.07319   |
| 1.05   | — 0.91592 | + 0.02902 | + 3.56029 | + 0.07132 |

## Bahn 6.

$$\eta_0 = + 1.710$$

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.0 | 0.00000   | + 1.71000 | 3.4 | + 0.01749 | + 1.92183 |
| 0.2 | — 0.00631 | 1.70662   | 3.5 | 0.04367   | 1.93462   |
| 0.4 | 0.01408   | 1.70377   | 3.6 | 0.07262   | 1.94625   |
| 0.6 | 0.02326   | 1.70174   | 3.7 | 0.10426   | 1.95642   |
| 0.8 | 0.03374   | 1.70092   | 3.8 | 0.13852   | 1.96480   |
| 1.0 | 0.04527   | 1.70168   | 3.9 | 0.17523   | 1.97106   |
| 1.2 | 0.05749   | 1.70446   | 4.0 | 0.21419   | 1.97485   |
| 1.4 | 0.06987   | 1.70967   | 4.1 | 0.25515   | 1.97581   |
| 1.6 | 0.08172   | 1.71771   | 4.2 | 0.29780   | 1.97360   |
| 1.8 | 0.09218   | 1.72894   | 4.3 | 0.34176   | 1.96788   |
| 2.0 | 0.10023   | 1.74359   | 4.4 | 0.38658   | 1.95831   |
| 2.2 | 0.10468   | 1.76178   | 4.5 | 0.43177   | 1.94457   |
| 2.4 | 0.10423   | 1.78346   | 4.6 | 0.47675   | 1.92636   |
| 2.6 | 0.09751   | 1.80828   | 4.7 | 0.52089   | 1.90341   |
| 2.8 | 0.08315   | 1.83566   | 4.8 | 0.56347   | 1.87547   |
|     |           |           | 4.9 | 0.60373   | 1.84231   |
| 2.9 | 0.07269   | 1.85003   | 5.0 | 0.64082   | 1.80374   |
| 3.0 | 0.05985   | 1.86465   | 5.1 | 0.67384   | 1.75958   |
| 3.1 | 0.04451   | 1.87936   | 5.2 | 0.70179   | 1.70973   |
| 3.2 | 0.02656   | 1.89394   | 5.3 | 0.72362   | 1.65398   |
| 3.3 | — 0.00591 | + 1.90818 | 5.4 | + 0.73823 | + 1.59221 |

| $t$ | $\xi$    | $\eta$   | $t$ | $\xi$    | $\eta$   |
|-----|----------|----------|-----|----------|----------|
| 5.5 | +0.74443 | +1.52421 | 5.8 | +0.70010 | +1.27926 |
| 5.6 | 0.74099  | 1.44970  | 5.9 | 0.66020  | 1.18176  |
| 5.7 | +0.72664 | +1.36826 | 6.0 | +0.60597 | +1.07442 |

| $\psi$ | $\xi$    | $\eta$   | $E$      | $F$      |
|--------|----------|----------|----------|----------|
| 0.00   | +0.60597 | +1.07442 | +1.16590 | —0.99592 |
| 0.05   | 0.53470  | 0.95185  | 1.18833  | 0.89962  |
| 0.10   | 0.46033  | 0.83382  | 1.21943  | 0.79999  |
| 0.15   | 0.38615  | 0.72047  | 1.25787  | 0.69893  |
| 0.20   | 0.31376  | 0.61179  | 1.30265  | 0.59815  |
| 0.25   | 0.24328  | 0.50785  | 1.35325  | 0.49912  |
| 0.30   | 0.17376  | 0.40914  | 1.40956  | 0.40317  |
| 0.35   | 0.10350  | 0.31499  | 1.47196  | 0.31146  |
| 0.40   | +0.03039 | 0.22692  | 1.54115  | 0.22511  |
| 0.45   | —0.04822 | 0.14555  | 1.61823  | 0.14520  |
| 0.50   | 0.13371  | 0.07221  | 1.70455  | 0.07284  |
| 0.55   | 0.22873  | +0.00910 | 1.80155  | —0.00914 |
| 0.60   | 0.33378  | —0.04230 | 1.91074  | +0.04486 |
| 0.65   | 0.44817  | 0.07919  | 2.03353  | 0.08839  |
| 0.70   | 0.56889  | 0.10011  | 2.17092  | 0.12101  |
| 0.75   | 0.69051  | 0.10473  | 2.32336  | 0.14299  |
| 0.80   | 0.80504  | 0.09461  | 2.49046  | 0.15547  |
| 0.85   | 0.90265  | 0.07281  | 2.67073  | 0.16036  |
| 0.90   | 0.97337  | 0.04444  | 2.86146  | 0.16008  |
| 0.95   | 1.00886  | —0.01299 | 3.05884  | 0.15689  |
| 1.00   | 1.00475  | +0.01779 | 3.25826  | 0.15214  |
| 1.05   | —0.96055 | +0.04543 | +3.45778 | +0.14574 |

## Bahn 7.

$$\eta_0 = +1.708916$$

| $t$ | $\xi$    | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|----------|-----------|-----|-----------|-----------|
| 0.0 | 0.00000  | + 1.70892 | 3.2 | -0.02781  | + 1.90178 |
| 0.1 | -0.00312 | 1.70710   | 3.3 | -0.00616  | 1.91669   |
| 0.2 | 0.00663  | 1.70538   | 3.4 | + 0.01836 | 1.93096   |
| 0.3 | 0.01051  | 1.70379   | 3.5 | 0.04580   | 1.94433   |
| 0.4 | 0.01478  | 1.70238   | 3.6 | 0.07611   | 1.95648   |
| 0.5 | 0.01942  | 1.70119   | 3.7 | 0.10926   | 1.96708   |
| 0.6 | 0.02442  | 1.70026   | 3.8 | 0.14512   | 1.97581   |
| 0.7 | 0.02976  | 1.69965   | 3.9 | 0.18354   | 1.98230   |
| 0.8 | 0.03541  | 1.69940   | 4.0 | 0.22432   | 1.98619   |
| 0.9 | 0.04134  | 1.69957   | 4.1 | 0.26716   | 1.98713   |
| 1.0 | 0.04751  | 1.70021   | 4.2 | 0.31176   | 1.98474   |
| 1.1 | 0.05386  | 1.70138   | 4.3 | 0.35771   | 1.97867   |
| 1.2 | 0.06033  | 1.70314   | 4.4 | 0.40455   | 1.96858   |
| 1.3 | 0.06684  | 1.70553   | 4.5 | 0.45175   | 1.95413   |
| 1.4 | 0.07331  | 1.70861   | 4.6 | 0.49871   | 1.93502   |
| 1.5 | 0.07964  | 1.71244   | 4.7 | 0.54477   | 1.91097   |
| 1.6 | 0.08573  | 1.71706   | 4.8 | 0.58919   | 1.88172   |
| 1.7 | 0.09146  | 1.72251   | 4.9 | 0.63116   | 1.84705   |
| 1.8 | 0.09670  | 1.72884   | 5.0 | 0.66978   | 1.80677   |
| 1.9 | 0.10131  | 1.73606   | 5.1 | 0.70412   | 1.76071   |
| 2.0 | 0.10513  | 1.74421   | 5.2 | 0.73314   | 1.70872   |
| 2.1 | 0.10802  | 1.75328   | 5.3 | 0.75574   | 1.65067   |
| 2.2 | 0.10979  | 1.76329   | 5.4 | 0.77076   | 1.58639   |
| 2.3 | 0.11028  | 1.77421   | 5.5 | 0.77693   | 1.51567   |
| 2.4 | 0.10931  | 1.78601   | 5.6 | 0.77297   | 1.43821   |
| 2.5 | 0.10669  | 1.79864   | 5.7 | 0.75753   | 1.35353   |
| 2.6 | 0.10225  | 1.81204   | 5.8 | 0.72926   | 1.26090   |
| 2.7 | 0.09580  | 1.82610   | 5.9 | 0.68690   | 1.15920   |
| 2.8 | 0.08717  | 1.84073   | 6.0 | 0.62948   | 1.04680   |
| 2.9 | 0.07619  | 1.85579   | 6.1 | 0.55662   | 0.92153   |
| 3.0 | 0.06273  | 1.87111   | 6.2 | + 0.46901 | + 0.78093 |
| 3.1 | -0.04664 | + 1.88651 |     |           |           |

| $\psi$ | $\xi$     | $\eta$    | $E$       | $F$       |
|--------|-----------|-----------|-----------|-----------|
| 0.00   | + 0.62946 | + 1.04681 | + 1.14489 | — 0.98324 |
| 0.05   | 0.55676   | 0.92182   | 1.16670   | 0.88319   |
| 0.10   | 0.48204   | 0.80160   | 1.19686   | 0.77968   |
| 0.15   | 0.40866   | 0.68610   | 1.23391   | 0.67461   |
| 0.20   | 0.33812   | 0.57517   | 1.27675   | 0.56965   |
| 0.25   | 0.27053   | 0.46876   | 1.32475   | 0.46624   |
| 0.30   | 0.20479   | 0.36688   | 1.37778   | 0.36563   |
| 0.35   | 0.13914   | 0.26970   | 1.43613   | 0.26891   |
| 0.40   | + 0.07134 | 0.17765   | 1.50050   | 0.17716   |
| 0.45   | — 0.00111 | 0.09159   | 1.57191   | 0.09146   |
| 0.50   | 0.08080   | + 0.01285 | 1.65168   | — 0.01289 |
| 0.55   | 0.16993   | — 0.05654 | 1.74128   | + 0.05734 |
| 0.60   | 0.27002   | 0.11398   | 1.84227   | 0.11804   |
| 0.65   | 0.38119   | 0.15646   | 1.95614   | 0.16805   |
| 0.70   | 0.50157   | 0.18119   | 2.08410   | 0.20652   |
| 0.75   | 0.62671   | 0.18637   | 2.22694   | 0.23310   |
| 0.80   | 0.74950   | 0.17219   | 2.38472   | 0.24821   |
| 0.85   | 0.86058   | 0.14132   | 2.55659   | 0.25320   |
| 0.90   | 0.94962   | 0.09869   | 2.74059   | 0.25022   |
| 0.95   | 1.00719   | 0.05040   | 2.93363   | 0.24174   |
| 1.00   | 1.02648   | — 0.00232 | 3.13159   | 0.22984   |
| 1.05   | — 1.00523 | + 0.04059 | + 3.32973 | + 0.21547 |

## Bahn 8.

$$\eta_0 = +1.705$$

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.0 | 0.00000   | + 1.70500 | 0.5 | — 0.02272 | + 1.69595 |
| 0.1 | — 0.00366 | 1.70287   | 0.6 | 0.02858   | 1.69486   |
| 0.2 | 0.00775   | 1.70086   | 0.7 | 0.03483   | 1.69414   |
| 0.3 | 0.01230   | 1.69900   | 0.8 | 0.04145   | 1.69385   |
| 0.4 | — 0.01729 | + 1.69735 | 0.9 | — 0.04840 | + 1.69404 |

| $t$ | $\xi$    | $\eta$   | $t$ | $\xi$    | $\eta$   |
|-----|----------|----------|-----|----------|----------|
| 1.0 | —0.05563 | +1.69479 | 3.4 | +0.02089 | +1.96450 |
| 1.1 | 0.06307  | 1.69615  | 3.5 | 0.05289  | 1.98001  |
| 1.2 | 0.07065  | 1.69820  | 3.6 | 0.08823  | 1.99407  |
| 1.3 | 0.07828  | 1.70100  | 3.7 | 0.12683  | 2.00630  |
| 1.4 | 0.08588  | 1.70460  | 3.8 | 0.16857  | 2.01630  |
| 1.5 | 0.09331  | 1.70908  | 3.9 | 0.21326  | 2.02367  |
| 1.6 | 0.10046  | 1.71448  | 4.0 | 0.26064  | 2.02799  |
| 1.7 | 0.10720  | 1.72086  | 4.1 | 0.31038  | 2.02884  |
| 1.8 | 0.11335  | 1.72826  | 4.2 | 0.36210  | 2.02582  |
| 1.9 | 0.11877  | 1.73672  | 4.3 | 0.41533  | 2.01851  |
| 2.0 | 0.12327  | 1.74625  | 4.4 | 0.46954  | 2.00654  |
| 2.1 | 0.12668  | 1.75688  | 4.5 | 0.52410  | 1.98954  |
| 2.2 | 0.12878  | 1.76860  | 4.6 | 0.57832  | 1.96718  |
| 2.3 | 0.12937  | 1.78138  | 4.7 | 0.63143  | 1.93918  |
| 2.4 | 0.12825  | 1.79520  | 4.8 | 0.68256  | 1.90526  |
| 2.5 | 0.12520  | 1.80999  | 4.9 | 0.73080  | 1.86521  |
| 2.6 | 0.12001  | 1.82567  | 5.0 | 0.77510  | 1.81885  |
| 2.7 | 0.11247  | 1.84213  | 5.1 | 0.81437  | 1.76604  |
| 2.8 | 0.10239  | 1.85924  | 5.2 | 0.84742  | 1.70664  |
| 2.9 | 0.08956  | 1.87685  | 5.3 | 0.87295  | 1.64055  |
| 3.0 | 0.07382  | 1.89475  | 5.4 | 0.88960  | 1.56761  |
| 3.1 | 0.05502  | 1.91273  | 5.5 | 0.89588  | 1.48759  |
| 3.2 | 0.03302  | 1.93054  | 5.6 | 0.89022  | 1.40012  |
| 3.3 | —0.00774 | +1.94790 | 5.7 | +0.87095 | +1.30453 |

| $\psi$ | $\xi$    | $\eta$   | $E$      | $F$      |
|--------|----------|----------|----------|----------|
| 0.00   | +0.89024 | +1.40013 | +1.07703 | —1.24370 |
| 0.05   | 0.85472  | 1.25034  | 1.05982  | 1.15727  |
| 0.10   | 0.79537  | 1.10522  | 1.05624  | 1.05978  |
| 0.15   | 0.72262  | 0.96618  | 1.06451  | 0.95356  |
| 0.20   | 0.64520  | 0.83332  | 1.08236  | 0.84098  |
| 0.25   | +0.56936 | +0.70603 | +1.10746 | —0.72424 |

| $\psi$ | $\xi$     | $\eta$    | $E$       | $F$       |
|--------|-----------|-----------|-----------|-----------|
| 0.30   | + 0.49879 | + 0.58356 | + 1.13783 | — 0.60525 |
| 0.35   | 0.43505   | 0.46525   | 1.17194   | 0.48557   |
| 0.40   | 0.37814   | 0.35045   | 1.20884   | 0.36648   |
| 0.45   | 0.32703   | 0.23860   | 1.24807   | 0.24901   |
| 0.50   | 0.27993   | 0.12918   | 1.28967   | 0.13406   |
| 0.55   | 0.23457   | + 0.02183 | 1.33408   | — 0.02246 |
| 0.60   | 0.18826   | — 0.08348 | 1.38210   | + 0.08489 |
| 0.65   | 0.13792   | 0.18626   | 1.43484   | 0.18691   |
| 0.70   | 0.08017   | 0.28517   | 1.49364   | 0.28226   |
| 0.75   | + 0.01157 | 0.37771   | 1.55998   | 0.36928   |
| 0.80   | — 0.07105 | 0.45993   | 1.63537   | 0.44596   |
| 0.85   | 0.16978   | 0.52635   | 1.72123   | 0.50997   |
| 0.90   | 0.28465   | 0.57046   | 1.81865   | 0.55889   |
| 0.95   | 0.41273   | 0.58580   | 1.92830   | 0.59043   |
| 1.00   | 0.54782   | 0.56784   | 2.05037   | 0.60286   |
| 1.05   | 0.68110   | 0.51602   | 2.18456   | 0.59542   |
| 1.10   | 0.80284   | 0.43495   | 2.33022   | 0.56861   |
| 1.15   | 0.90446   | 0.33426   | 2.48647   | 0.52428   |
| 1.20   | 0.97994   | 0.22681   | 2.65215   | 0.46545   |
| 1.25   | 1.02590   | 0.12620   | 2.82566   | 0.39579   |
| 1.30   | 1.04145   | — 0.04427 | 3.00469   | 0.31897   |
| 1.35   | — 1.02740 | + 0.01072 | + 3.18606 | + 0.23794 |

## Bahn 9.

$$\eta_0 = +1.700$$

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.0 | 0.00000   | + 1.70000 | 0.5 | — 0.02693 | + 1.68928 |
| 0.1 | — 0.00433 | 1.69748   | 0.6 | 0.03387   | 1.68798   |
| 0.2 | 0.00919   | 1.69509   | 0.7 | 0.04128   | 1.68713   |
| 0.3 | 0.01458   | 1.69289   | 0.8 | 0.04913   | 1.68677   |
| 0.4 | — 0.02049 | + 1.69093 | 0.9 | — 0.05738 | + 1.68699 |

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 1.0 | — 0.06595 | + 1.68787 | 3.4 | + 0.02370 | + 2.00686 |
| 1.1 | 0.07478   | 1.68948   | 3.5 | 0.06144   | 2.02506   |
| 1.2 | 0.08379   | 1.69190   | 3.6 | 0.10308   | 2.04150   |
| 1.3 | 0.09286   | 1.69520   | 3.7 | 0.14854   | 2.05573   |
| 1.4 | 0.10188   | 1.69946   | 3.8 | 0.19765   | 2.06730   |
| 1.5 | 0.11071   | 1.70476   | 3.9 | 0.25018   | 2.07572   |
| 1.6 | 0.11922   | 1.71115   | 4.0 | 0.30581   | 2.08051   |
| 1.7 | 0.12723   | 1.71870   | 4.1 | 0.36416   | 2.08120   |
| 1.8 | 0.13456   | 1.72747   | 4.2 | 0.42478   | 2.07730   |
| 1.9 | 0.14102   | 1.73748   | 4.3 | 0.48709   | 2.06837   |
| 2.0 | 0.14640   | 1.74878   | 4.4 | 0.55047   | 2.05398   |
| 2.1 | 0.15046   | 1.76137   | 4.5 | 0.61419   | 2.03374   |
| 2.2 | 0.15299   | 1.77525   | 4.6 | 0.67744   | 2.00729   |
| 2.3 | 0.15373   | 1.79040   | 4.7 | 0.73932   | 1.97434   |
| 2.4 | 0.15243   | 1.80678   | 4.8 | 0.79882   | 1.93463   |
| 2.5 | 0.14885   | 1.82430   | 4.9 | 0.85486   | 1.88796   |
| 2.6 | 0.14273   | 1.84288   | 5.0 | 0.90626   | 1.83420   |
| 2.7 | 0.13383   | 1.86238   | 5.1 | 0.95172   | 1.77325   |
| 2.8 | 0.12191   | 1.88264   | 5.2 | 0.98987   | 1.70504   |
| 2.9 | 0.10674   | 1.90346   | 5.3 | 1.01920   | 1.62953   |
| 3.0 | 0.08814   | 1.92463   | 5.4 | 1.03807   | 1.54664   |
| 3.1 | 0.06592   | 1.94587   | 5.5 | 1.04470   | 1.45619   |
| 3.2 | 0.03994   | 1.96689   | 5.6 | 1.03714   | 1.35778   |
| 3.3 | — 0.01008 | + 1.98734 | 5.7 | + 1.01328 | + 1.25057 |

| $\psi$ | $\xi$     | $\eta$    | $E$       | $F$       |
|--------|-----------|-----------|-----------|-----------|
| 0.00   | + 1.03713 | + 1.35778 | + 0.99449 | — 1.25920 |
| 0.05   | 0.99360   | 1.19075   | 0.96954   | 1.16331   |
| 0.10   | 0.92365   | 1.03299   | 0.95963   | 1.05463   |
| 0.15   | 0.84095   | 0.88489   | 0.96217   | 0.93586   |
| 0.20   | 0.75647   | 0.74525   | 0.97399   | 0.80961   |
| 0.25   | + 0.67780 | + 0.61231 | + 0.99196 | — 0.67825 |

| $\psi$ | $\xi$     | $\eta$    | $E$       | $F$       |
|--------|-----------|-----------|-----------|-----------|
| 0.30   | + 0.60913 | + 0.48451 | + 1.01339 | — 0.54374 |
| 0.35   | 0.55240   | 0.36052   | 1.03622   | 0.40760   |
| 0.40   | 0.50782   | 0.23914   | 1.05902   | 0.27096   |
| 0.45   | 0.47474   | + 0.11922 | 1.08098   | — 0.13467 |
| 0.50   | 0.45198   | — 0.00055 | 1.10181   | + 0.00062 |
| 0.55   | 0.43807   | 0.12133   | 1.12171   | 0.13428   |
| 0.60   | 0.43121   | 0.24433   | 1.14127   | 0.26561   |
| 0.65   | 0.42918   | 0.37052   | 1.16151   | 0.39365   |
| 0.70   | 0.42903   | 0.50046   | 1.18377   | 0.51708   |
| 0.75   | 0.42679   | 0.63376   | 1.20966   | 0.63407   |
| 0.80   | 0.41734   | 0.76847   | 1.24090   | 0.74222   |
| 0.85   | 0.39481   | 0.90052   | 1.27904   | 0.83849   |
| 0.875  | 0.37683   | 0.96347   | 1.30102   | 0.88111   |
| 0.900  | 0.35362   | 1.02287   | 1.32501   | 0.91944   |
| 0.925  | 0.32487   | 1.07741   | 1.35093   | 0.95304   |
| 0.950  | 0.29059   | 1.12570   | 1.37863   | 0.98147   |
| 0.975  | 0.25114   | 1.16627   | 1.40786   | 1.00436   |
| 1.000  | 0.20729   | 1.19784   | 1.43825   | 1.02137   |
| 1.025  | 0.16016   | 1.21936   | 1.46937   | 1.03229   |
| 1.050  | 0.11118   | 1.23000   | 1.50071   | 1.03697   |
| 1.075  | 0.06195   | 1.22955   | 1.53171   | 1.03537   |
| 1.100  | + 0.01411 | 1.21815   | 1.56183   | 1.02758   |
| 1.125  | — 0.03079 | 1.19637   | 1.59055   | 1.01379   |
| 1.150  | 0.07155   | 1.16512   | 1.61739   | 0.99428   |
| 1.175  | 0.10721   | 1.12570   | 1.64196   | 0.96942   |
| 1.200  | 0.13721   | 1.07945   | 1.66396   | 0.93964   |
| 1.225  | 0.16134   | 1.02774   | 1.68319   | 0.90539   |
| 1.250  | 0.17973   | 0.97193   | 1.69952   | 0.86718   |
| 1.275  | 0.19271   | 0.91318   | 1.71292   | 0.82549   |
| 1.300  | 0.20077   | 0.85257   | 1.72342   | 0.78080   |
| 1.325  | 0.20449   | 0.79092   | 1.73108   | 0.73359   |
| 1.350  | 0.20449   | 0.72889   | 1.73601   | 0.68429   |
| 1.375  | 0.20132   | 0.66698   | 1.73834   | 0.63328   |
| 1.400  | — 0.19552 | — 0.60559 | + 1.73819 | + 0.58094 |

| $\psi$ | $\xi$    | $\eta$   | $E$      | $F$      |
|--------|----------|----------|----------|----------|
| 1.425  | —0.18755 | —0.54492 | +1.73571 | +0.52759 |
| 1.450  | 0.17773  | 0.48513  | 1.73100  | 0.47353  |
| 1.475  | 0.16636  | 0.42632  | 1.72416  | 0.41902  |
| 1.500  | 0.15362  | 0.36852  | 1.71526  | 0.36430  |
| 1.525  | 0.13961  | 0.31173  | 1.70437  | 0.30956  |
| 1.550  | 0.12436  | 0.25593  | 1.69151  | 0.25504  |
| 1.575  | 0.10782  | 0.20109  | 1.67668  | 0.20088  |
| 1.600  | 0.08991  | 0.14721  | 1.65986  | 0.14726  |
| 1.625  | 0.07046  | 0.09427  | 1.64100  | 0.09436  |
| 1.650  | 0.04926  | —0.04230 | 1.62003  | +0.04234 |
| 1.675  | —0.02605 | +0.00862 | +1.59686 | —0.00863 |

## Bahn 10.

$$\eta_0 = +1.736$$

| $t$ | $\xi$    | $\eta$   | $t$ | $\xi$    | $\eta$   |
|-----|----------|----------|-----|----------|----------|
| 0.0 | 0.00000  | +1.73600 | 1.6 | +0.01445 | +1.73455 |
| 0.1 | +0.00053 | 1.73631  | 1.7 | 0.01540  | 1.73362  |
| 0.2 | 0.00113  | 1.73660  | 1.8 | 0.01627  | 1.73254  |
| 0.3 | 0.00179  | 1.73687  | 1.9 | 0.01703  | 1.73131  |
| 0.4 | 0.00252  | 1.73711  | 2.0 | 0.01765  | 1.72993  |
| 0.5 | 0.00331  | 1.73730  | 2.1 | 0.01811  | 1.72838  |
| 0.6 | 0.00416  | 1.73746  | 2.2 | 0.01838  | 1.72668  |
| 0.7 | 0.00507  | 1.73756  | 2.3 | 0.01844  | 1.72483  |
| 0.8 | 0.00602  | 1.73759  | 2.4 | 0.01825  | 1.72282  |
| 0.9 | 0.00703  | 1.73756  | 2.5 | 0.01778  | 1.72067  |
| 1.0 | 0.00806  | 1.73744  | 2.6 | 0.01700  | 1.71839  |
| 1.1 | 0.00913  | 1.73724  | 2.7 | 0.01588  | 1.71599  |
| 1.2 | 0.01021  | 1.73693  | 2.8 | 0.01439  | 1.71348  |
| 1.3 | 0.01130  | 1.73652  | 2.9 | 0.01250  | 1.71089  |
| 1.4 | 0.01238  | 1.73599  | 3.0 | 0.01017  | 1.70825  |
| 1.5 | +0.01344 | +1.73534 | 3.1 | +0.00740 | +1.70557 |

| $t$ | $\xi$    | $\eta$   | $t$  | $\xi$    | $\eta$   |
|-----|----------|----------|------|----------|----------|
| 3.2 | +0.00414 | +1.70290 | 6.6  | -0.01430 | +1.98608 |
| 3.3 | +0.00038 | 1.70026  | 6.7  | +0.01914 | 2.00585  |
| 3.4 | -0.00389 | 1.69771  | 6.8  | 0.05656  | 2.02433  |
| 3.5 | 0.00869  | 1.69528  | 6.9  | 0.09792  | 2.04111  |
| 3.6 | 0.01403  | 1.69304  | 7.0  | 0.14313  | 2.05574  |
| 3.7 | 0.01990  | 1.69103  | 7.1  | 0.19203  | 2.06773  |
| 3.8 | 0.02629  | 1.68932  | 7.2  | 0.24440  | 2.07663  |
| 3.9 | 0.03320  | 1.68797  | 7.3  | 0.29994  | 2.08194  |
| 4.0 | 0.04058  | 1.68704  | 7.4  | 0.35827  | 2.08318  |
| 4.1 | 0.04841  | 1.68662  | 7.5  | 0.41893  | 2.07987  |
| 4.2 | 0.05664  | 1.68676  | 7.6  | 0.48137  | 2.07156  |
| 4.3 | 0.06521  | 1.68755  | 7.7  | 0.54497  | 2.05782  |
| 4.4 | 0.07405  | 1.68906  | 7.8  | 0.60902  | 2.03824  |
| 4.5 | 0.08307  | 1.69138  | 7.9  | 0.67270  | 2.01248  |
| 4.6 | 0.09218  | 1.69457  | 8.0  | 0.73511  | 1.98021  |
| 4.7 | 0.10126  | 1.69872  | 8.1  | 0.79527  | 1.94118  |
| 4.8 | 0.11018  | 1.70390  | 8.2  | 0.85210  | 1.89520  |
| 4.9 | 0.11878  | 1.71018  | 8.3  | 0.90442  | 1.84210  |
| 5.0 | 0.12690  | 1.71762  | 8.4  | 0.95095  | 1.78180  |
| 5.1 | 0.13437  | 1.72626  | 8.5  | 0.99031  | 1.71423  |
| 5.2 | 0.14099  | 1.73616  | 8.6  | 1.02100  | 1.63936  |
| 5.3 | 0.14655  | 1.74735  | 8.7  | 1.04140  | 1.55710  |
| 5.4 | 0.15082  | 1.75984  | 8.8  | 1.04975  | 1.46729  |
| 5.5 | 0.15358  | 1.77362  | 8.9  | 1.04409  | 1.36958  |
| 5.6 | 0.15457  | 1.78869  |      |          |          |
| 5.7 | 0.15355  | 1.80499  | 8.70 | 1.04140  | 1.55708  |
| 5.8 | 0.15026  | 1.82246  | 8.75 | 1.04720  | 1.51315  |
| 5.9 | 0.14446  | 1.84101  | 8.80 | 1.04975  | 1.46729  |
| 6.0 | 0.13589  | 1.86050  | 8.85 | 1.04880  | 1.41947  |
| 6.1 | 0.12431  | 1.88077  | 8.90 | 1.04409  | 1.36959  |
| 6.2 | 0.10951  | 1.90165  | 8.95 | 1.03536  | 1.31756  |
| 6.3 | 0.09126  | 1.92290  | 9.00 | 1.02231  | 1.26322  |
| 6.4 | 0.06941  | 1.94426  | 9.05 | 1.00467  | 1.20638  |
| 6.5 | -0.04380 | +1.96543 | 9.10 | +0.98212 | +1.14673 |

| $t$   | $\xi$     | $\eta$    | $t$   | $\xi$     | $\eta$    |
|-------|-----------|-----------|-------|-----------|-----------|
| 9.15  | + 0.95438 | + 1.08390 | 9.400 | + 0.73176 | + 0.69536 |
| 9.20  | 0.92118   | 1.01733   | 9.425 | 0.70245   | 0.64587   |
| 9.25  | 0.88231   | 0.94633   | 9.450 | 0.67239   | 0.59352   |
| 9.30  | 0.83764   | 0.86991   | 9.475 | 0.64194   | 0.53804   |
| 9.35  | 0.78728   | 0.78681   | 9.500 | 0.61158   | 0.47917   |
| 9.40  | 0.73178   | 0.69536   | 9.525 | 0.58186   | 0.41677   |
| 9.45  | 0.67237   | 0.59355   | 9.550 | 0.55348   | 0.35080   |
|       |           |           | 9.575 | 0.52719   | 0.28142   |
| 9.300 | 0.83763   | 0.86991   | 9.600 | 0.50375   | 0.20912   |
| 9.325 | 0.81315   | 0.82929   | 9.625 | 0.48384   | 0.13455   |
| 9.350 | 0.78728   | 0.78681   | 9.650 | 0.46774   | + 0.05864 |
| 9.375 | + 0.76011 | + 0.74225 | 9.675 | + 0.45562 | — 0.01753 |

Bahn 11.  
Periodische Bahn III.  
 $\eta_0 = + 1.7368865$

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.0 | 0.00000   | + 1.73689 | 2.8 | + 0.01762 | + 1.70931 |
| 0.2 | + 0.00138 | 1.73762   | 3.0 | 0.01246   | 1.70290   |
| 0.4 | 0.00308   | 1.73824   | 3.2 | + 0.00507 | 1.69635   |
| 0.6 | 0.00509   | 1.73868   | 3.4 | — 0.00477 | 1.69001   |
| 0.8 | 0.00737   | 1.73885   | 3.6 | 0.01718   | 1.68430   |
| 1.0 | 0.00988   | 1.73866   | 3.8 | 0.03220   | 1.67974   |
| 1.2 | 0.01252   | 1.73804   | 4.0 | 0.04971   | 1.67694   |
| 1.4 | 0.01518   | 1.73688   | 4.2 | 0.06941   | 1.67657   |
| 1.6 | 0.01771   | 1.73511   | 4.4 | 0.09080   | 1.67936   |
| 1.8 | 0.01993   | 1.73265   | 4.6 | 0.11309   | 1.68609   |
| 2.0 | 0.02162   | 1.72945   | 4.8 | 0.13524   | 1.69749   |
| 2.2 | 0.02252   | 1.72548   | 5.0 | 0.15585   | 1.71427   |
| 2.4 | 0.02235   | 1.72074   | 5.2 | 0.17324   | 1.73697   |
| 2.6 | + 0.02082 | + 1.71532 | 5.4 | — 0.18541 | + 1.76597 |

| $t$ | $\xi$    | $\eta$   | $t$ | $\xi$    | $\eta$   |
|-----|----------|----------|-----|----------|----------|
| 5.6 | -0.19011 | +1.80132 | 8.0 | +0.88629 | +2.03034 |
| 5.8 | 0.18493  | 1.84270  | 8.1 | 0.95834  | 1.98321  |
| 6.0 | 0.16740  | 1.88928  | 8.2 | 1.02632  | 1.92804  |
| 6.2 | 0.13517  | 1.93963  | 8.3 | 1.08887  | 1.86478  |
| 6.4 | 0.08620  | 1.99165  | 8.4 | 1.14449  | 1.79344  |
| 6.6 | -0.01896 | 2.04254  | 8.5 | 1.19154  | 1.71412  |
| 6.8 | +0.06734 | 2.08882  | 8.6 | 1.22829  | 1.62695  |
| 7.0 | 0.17255  | 2.12646  | 8.7 | 1.25278  | 1.53208  |
| 7.2 | 0.29533  | 2.15102  | 8.8 | 1.26289  | 1.42958  |
| 7.4 | 0.43303  | 2.15789  | 8.9 | 1.25618  | 1.31931  |
| 7.6 | 0.58150  | 2.14261  | 9.0 | +1.22986 | +1.20066 |
| 7.8 | +0.73503 | +2.10116 |     |          |          |

| $\psi$ | $\xi$    | $\eta$   | $E$      | $F$      |
|--------|----------|----------|----------|----------|
| 0.00   | +1.22986 | +1.20067 | +0.85655 | -1.24316 |
| 0.04   | 1.17208  | 1.05400  | 0.83229  | 1.15262  |
| 0.08   | 1.09803  | 0.91916  | 0.81882  | 1.05293  |
| 0.12   | 1.01716  | 0.79482  | 0.81406  | 0.94574  |
| 0.16   | 0.93698  | 0.67887  | 0.81570  | 0.83265  |
| 0.20   | 0.86286  | 0.56933  | 0.82146  | 0.71509  |
| 0.24   | 0.79818  | 0.46449  | 0.82932  | 0.59425  |
| 0.28   | 0.74493  | 0.36313  | 0.83755  | 0.47112  |
| 0.32   | 0.70408  | 0.26430  | 0.84483  | 0.34644  |
| 0.36   | 0.67600  | 0.16723  | 0.85016  | 0.22078  |
| 0.40   | 0.66077  | +0.07131 | 0.85287  | -0.09454 |
| 0.44   | 0.65836  | -0.02405 | 0.85261  | +0.03194 |
| 0.48   | 0.66882  | 0.11942  | 0.84930  | 0.15840  |
| 0.52   | +0.69225 | -0.21536 | +0.84313 | +0.28455 |

## Bahn 12.

$$\eta_0 = +1.737$$

| $t$ | $\xi$    | $\eta$   | $t$ | $\xi$    | $\eta$   |
|-----|----------|----------|-----|----------|----------|
| 0.0 | 0.00000  | +1.73700 | 4.4 | -0.09293 | +1.67824 |
| 0.2 | +0.00142 | 1.73776  | 4.6 | 0.11572  | 1.68513  |
| 0.4 | 0.00315  | 1.73839  | 4.8 | 0.13836  | 1.69681  |
| 0.6 | 0.00521  | 1.73884  | 5.0 | 0.15944  | 1.71398  |
| 0.8 | 0.00754  | 1.73901  | 5.2 | 0.17721  | 1.73721  |
| 1.0 | 0.01010  | 1.73882  | 5.4 | 0.18964  | 1.76688  |
| 1.2 | 0.01281  | 1.73818  | 5.6 | 0.19442  | 1.80305  |
| 1.4 | 0.01553  | 1.73700  | 5.8 | 0.18908  | 1.84538  |
| 1.6 | 0.01812  | 1.73518  | 6.0 | 0.17110  | 1.89302  |
| 1.8 | 0.02039  | 1.73266  | 6.2 | 0.13808  | 1.94450  |
| 2.0 | 0.02210  | 1.72938  | 6.4 | 0.08796  | 1.99766  |
| 2.2 | 0.02301  | 1.72532  | 6.6 | -0.01916 | 2.04962  |
| 2.4 | 0.02283  | 1.72048  | 6.8 | +0.06911 | 2.09684  |
| 2.6 | 0.02125  | 1.71493  | 7.0 | 0.17665  | 2.13517  |
| 2.8 | 0.01797  | 1.70879  | 7.2 | 0.30210  | 2.16007  |
| 3.0 | 0.01269  | 1.70224  | 7.4 | 0.44273  | 2.16686  |
| 3.2 | +0.00512 | 1.69555  | 7.6 | 0.59428  | 2.15098  |
| 3.4 | -0.00494 | 1.68907  | 7.8 | 0.75091  | 2.10838  |
| 3.6 | 0.01764  | 1.68324  | 8.0 | 0.90515  | 2.03585  |
| 3.8 | 0.03300  | 1.67859  | 8.2 | 1.04787  | 1.93131  |
| 4.0 | 0.05091  | 1.67574  | 8.4 | 1.16824  | 1.79402  |
| 4.2 | -0.07106 | +1.67537 | 8.6 | +1.25355 | +1.62458 |

| $\psi$ | $\xi$    | $\eta$   | $E$      | $F$      |
|--------|----------|----------|----------|----------|
| 0.00   | +1.04788 | +1.93130 | +1.11352 | -1.50980 |
| 0.04   | 1.17351  | 1.78625  | 1.03637  | 1.47695  |
| 0.08   | 1.25435  | 1.62219  | 0.96713  | 1.43033  |
| 0.12   | 1.28761  | 1.45180  | 0.90881  | 1.37000  |
| 0.16   | 1.27753  | 1.28559  | 0.86314  | 1.29666  |
| 0.20   | +1.23317 | +1.12974 | +0.83043 | -1.21148 |

| $\psi$ | $\xi$     | $\eta$    | $E$       | $F$       |
|--------|-----------|-----------|-----------|-----------|
| 0.24   | + 1.16565 | + 0.98660 | + 0.80973 | — 1.11600 |
| 0.28   | 1.08575   | 0.85560   | 0.79922   | 1.01188   |
| 0.32   | 1.00249   | 0.73480   | 0.79662   | 0.90082   |
| 0.36   | 0.92272   | 0.62186   | 0.79951   | 0.78436   |
| 0.40   | 0.85098   | 0.51478   | 0.80562   | 0.66388   |
| 0.44   | 0.79017   | 0.41198   | 0.81300   | 0.54048   |
| 0.48   | 0.74180   | 0.31228   | 0.82005   | 0.41508   |
| 0.52   | 0.70657   | 0.21484   | 0.82552   | 0.28833   |
| 0.56   | 0.68470   | 0.11898   | 0.82856   | 0.16075   |
| 0.60   | 0.67627   | + 0.02410 | 0.82860   | — 0.03269 |
| 0.64   | 0.68135   | — 0.07031 | 0.82542   | + 0.09554 |
| 0.68   | 0.70005   | 0.16475   | 0.81905   | 0.22366   |
| 0.72   | 0.73260   | 0.25974   | 0.80987   | 0.35137   |
| 0.76   | 0.77908   | 0.35581   | 0.79854   | 0.47826   |
| 0.80   | 0.83936   | 0.45369   | 0.78610   | 0.60380   |
| 0.84   | 0.91272   | 0.55436   | 0.77400   | 0.72725   |
| 0.88   | 0.99737   | 0.65930   | 0.76406   | 0.84770   |
| 0.92   | 1.09003   | 0.77067   | 0.75855   | 0.96399   |
| 0.96   | 1.18536   | 0.89148   | 0.76002   | 1.07479   |
| 1.00   | 1.27544   | 1.02540   | 0.77127   | 1.17861   |
| 1.04   | 1.34988   | 1.17595   | 0.79484   | 1.27392   |
| 1.08   | 1.39597   | 1.34524   | 0.83288   | 1.35924   |
| 1.12   | 1.40031   | 1.53200   | 0.88660   | 1.43329   |
| 1.16   | 1.35094   | 1.73004   | 0.95598   | 1.49515   |
| 1.20   | 1.24063   | 1.92756   | 1.03960   | 1.54431   |
| 1.24   | 1.06950   | 2.10881   | 1.13477   | 1.58078   |
| 1.28   | 0.84633   | 2.25753   | 1.23786   | 1.60509   |
| 1.32   | 0.58701   | 2.36117   | 1.34492   | 1.61814   |
| 1.36   | 0.31116   | 2.41344   | 1.45212   | 1.62111   |
| 1.40   | + 0.03809 | 2.41472   | 1.55622   | 1.61519   |
| 1.44   | — 0.21609 | 2.37089   | 1.65462   | 1.60142   |
| 1.48   | 0.43983   | 2.29053   | 1.74540   | 1.58056   |
| 1.52   | — 0.62588 | — 2.18340 | + 1.82711 | + 1.55306 |

## Bahn 13.

$$\eta_0 = +1.738$$

| $t$ | $\xi$    | $\eta$   | $t$ | $\xi$    | $\eta$   |
|-----|----------|----------|-----|----------|----------|
| 0.0 | 0.00000  | +1.73800 | 3.2 | +0.00618 | +1.68815 |
| 0.1 | +0.00080 | 1.73847  | 3.3 | +0.00051 | 1.68418  |
| 0.2 | 0.00170  | 1.73891  | 3.4 | -0.00593 | 1.68033  |
| 0.3 | 0.00270  | 1.73931  | 3.5 | 0.01317  | 1.67668  |
| 0.4 | 0.00379  | 1.73967  | 3.6 | 0.02122  | 1.67329  |
| 0.5 | 0.00498  | 1.73997  | 3.7 | 0.03007  | 1.67025  |
| 0.6 | 0.00626  | 1.74020  | 3.8 | 0.03972  | 1.66766  |
| 0.7 | 0.00762  | 1.74035  | 3.9 | 0.05015  | 1.66560  |
| 0.8 | 0.00906  | 1.74041  | 4.0 | 0.06132  | 1.66418  |
| 0.9 | 0.01057  | 1.74036  | 4.1 | 0.07318  | 1.66350  |
| 1.0 | 0.01214  | 1.74019  | 4.2 | 0.08565  | 1.66369  |
| 1.1 | 0.01374  | 1.73988  | 4.3 | 0.09865  | 1.66485  |
| 1.2 | 0.01538  | 1.73942  | 4.4 | 0.11208  | 1.66710  |
| 1.3 | 0.01703  | 1.73880  | 4.5 | 0.12581  | 1.67055  |
| 1.4 | 0.01866  | 1.73800  | 4.6 | 0.13968  | 1.67534  |
| 1.5 | 0.02025  | 1.73701  | 4.7 | 0.15352  | 1.68156  |
| 1.6 | 0.02177  | 1.73582  | 4.8 | 0.16712  | 1.68934  |
| 1.7 | 0.02320  | 1.73442  | 4.9 | 0.18028  | 1.69878  |
| 1.8 | 0.02450  | 1.73280  | 5.0 | 0.19272  | 1.70997  |
| 1.9 | 0.02564  | 1.73094  | 5.1 | 0.20418  | 1.72300  |
| 2.0 | 0.02657  | 1.72886  | 5.2 | 0.21436  | 1.73792  |
| 2.1 | 0.02726  | 1.72653  | 5.3 | 0.22293  | 1.75480  |
| 2.2 | 0.02767  | 1.72397  | 5.4 | 0.22956  | 1.77365  |
| 2.3 | 0.02775  | 1.72118  | 5.5 | 0.23388  | 1.79447  |
| 2.4 | 0.02746  | 1.71816  | 5.6 | 0.23553  | 1.81722  |
| 2.5 | 0.02675  | 1.71492  | 5.7 | 0.23413  | 1.84185  |
| 2.6 | 0.02557  | 1.71148  | 5.8 | 0.22929  | 1.86824  |
| 2.7 | 0.02388  | 1.70786  | 5.9 | 0.22064  | 1.89624  |
| 2.8 | 0.02163  | 1.70409  | 6.0 | 0.20781  | 1.92564  |
| 2.9 | 0.01877  | 1.70019  | 6.1 | 0.19045  | 1.95619  |
| 3.0 | 0.01527  | 1.69621  | 6.2 | 0.16824  | 1.98759  |
| 3.1 | +0.01109 | +1.69217 | 6.3 | -0.14089 | +2.01948 |

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 6.4 | — 0.10814 | + 2.05145 | 7.7 | + 0.79703 | + 2.20847 |
| 6.5 | 0.06980   | 2.08301   | 7.8 | 0.88990   | 2.17823   |
| 6.6 | — 0.02573 | 2.11366   | 7.9 | 0.98202   | 2.13922   |
| 6.7 | + 0.02415 | 2.14282   | 8.0 | 1.07212   | 2.09115   |
| 6.8 | 0.07985   | 2.16988   | 8.1 | 1.15883   | 2.03386   |
| 6.9 | 0.14127   | 2.19419   | 8.2 | 1.24069   | 1.96731   |
| 7.0 | 0.20825   | 2.21509   | 8.3 | 1.31609   | 1.89159   |
| 7.1 | 0.28052   | 2.23188   | 8.4 | 1.38334   | 1.80692   |
| 7.2 | 0.35771   | 2.24387   | 8.5 | 1.44060   | 1.71364   |
| 7.3 | 0.43935   | 2.25036   | 8.6 | 1.48591   | 1.61222   |
| 7.4 | 0.52486   | 2.25068   | 8.7 | 1.51710   | 1.50322   |
| 7.5 | 0.61353   | 2.24420   | 8.8 | 1.53177   | 1.38722   |
| 7.6 | + 0.70456 | + 2.23030 | 8.9 | + 1.52715 | + 1.26473 |

| $\psi$ | $\xi$    | $\eta$   | $E$       | $F$       |
|--------|----------|----------|-----------|-----------|
| 0.00   | + 1.5172 | + 1.5032 | + 0.83512 | — 1.45590 |
| 0.02   | 1.5312   | 1.3992   | 0.79851   | 1.42256   |
| 0.04   | 1.5305   | 1.2983   | 0.76580   | 1.38541   |
| 0.06   | 1.5169   | 1.2018   | 0.73710   | 1.34462   |
| 0.08   | 1.4920   | 1.1107   | 0.71243   | 1.30037   |
| 0.10   | 1.4580   | 1.0252   | 0.69169   | 1.25289   |
| 0.12   | 1.4168   | 0.9456   | 0.67469   | 1.20242   |
| 0.14   | 1.3704   | 0.8715   | 0.66114   | 1.14921   |
| 0.16   | 1.3207   | 0.8026   | 0.65072   | 1.09352   |
| 0.18   | 1.2691   | 0.7381   | 0.64306   | 1.03560   |
| 0.20   | 1.2172   | 0.6776   | 0.63775   | 0.97570   |
| 0.22   | 1.1660   | 0.6204   | 0.63441   | 0.91405   |
| 0.24   | 1.1165   | 0.5660   | 0.63264   | 0.85087   |
| 0.26   | 1.0694   | 0.5140   | 0.63207   | 0.78636   |
| 0.28   | 1.0254   | 0.4638   | 0.63234   | 0.72073   |
| 0.30   | 0.9849   | 0.4152   | 0.63313   | 0.65413   |
| 0.32   | + 0.9482 | + 0.3679 | + 0.63414 | — 0.58672 |

| $\psi$ | $\xi$    | $\eta$   | $E$       | $F$       |
|--------|----------|----------|-----------|-----------|
| 0.34   | + 0.9157 | + 0.3216 | + 0.63510 | — 0.51863 |
| 0.36   | 0.8874   | 0.2763   | 0.63578   | 0.44997   |
| 0.38   | 0.8635   | 0.2317   | 0.63599   | 0.38084   |
| 0.40   | 0.8441   | 0.1878   | 0.63554   | 0.31133   |
| 0.42   | 0.8291   | 0.1445   | 0.63432   | 0.24153   |
| 0.44   | 0.8186   | 0.1018   | 0.63220   | 0.17148   |
| 0.46   | 0.8127   | 0.0597   | 0.62910   | 0.10126   |
| 0.48   | 0.8114   | + 0.0181 | 0.62498   | — 0.03090 |
| 0.50   | 0.8146   | — 0.0230 | 0.61980   | + 0.03954 |
| 0.52   | + 0.8225 | — 0.0635 | + 0.61356 | + 0.11004 |

Bahn 14.  
Periodische Bahn IV.

$$\eta_0 = +1.740$$

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.0 | 0.00000   | + 1.74000 | 1.6 | + 0.02946 | + 1.73741 |
| 0.1 | + 0.00107 | 1.74063   | 1.7 | 0.03143   | 1.73555   |
| 0.2 | 0.00227   | 1.74123   | 1.8 | 0.03322   | 1.73338   |
| 0.3 | 0.00360   | 1.74177   | 1.9 | 0.03480   | 1.73091   |
| 0.4 | 0.00506   | 1.74228   | 2.0 | 0.03611   | 1.72812   |
| 0.5 | 0.00665   | 1.74271   | 2.1 | 0.03711   | 1.72501   |
| 0.6 | 0.00837   | 1.74305   | 2.2 | 0.03772   | 1.72158   |
| 0.7 | 0.01021   | 1.74328   | 2.3 | 0.03791   | 1.71783   |
| 0.8 | 0.01216   | 1.74339   | 2.4 | 0.03760   | 1.71377   |
| 0.9 | 0.01421   | 1.74335   | 2.5 | 0.03674   | 1.70943   |
| 1.0 | 0.01634   | 1.74314   | 2.6 | 0.03525   | 1.70480   |
| 1.1 | 0.01852   | 1.74275   | 2.7 | 0.03309   | 1.69992   |
| 1.2 | 0.02075   | 1.74216   | 2.8 | 0.03017   | 1.69481   |
| 1.3 | 0.02299   | 1.74135   | 2.9 | 0.02645   | 1.68953   |
| 1.4 | 0.02521   | 1.74030   | 3.0 | 0.02185   | 1.68410   |
| 1.5 | + 0.02737 | + 1.73899 | 3.1 | + 0.01633 | + 1.67860 |

| $t$ | $\xi$     | $\eta$    | $t$  | $\xi$     | $\eta$    |
|-----|-----------|-----------|------|-----------|-----------|
| 3.2 | + 0.00982 | + 1.67308 | 6.6  | — 0.05880 | + 2.24393 |
| 3.3 | + 0.00230 | 1.66763   | 6.7  | + 0.00687 | 2.28391   |
| 3.4 | — 0.00628 | 1.66232   | 6.8  | 0.08032   | 2.32103   |
| 3.5 | 0.01595   | 1.65724   | 6.9  | 0.16143   | 2.35439   |
| 3.6 | 0.02673   | 1.65249   | 7.0  | 0.24996   | 2.38309   |
| 3.7 | 0.03863   | 1.64819   | 7.1  | 0.34555   | 2.40618   |
| 3.8 | 0.05164   | 1.64446   | 7.2  | 0.44769   | 2.42274   |
| 3.9 | 0.06573   | 1.64143   | 7.3  | 0.55577   | 2.43186   |
| 4.0 | 0.08085   | 1.63923   | 7.4  | 0.66901   | 2.43266   |
| 4.1 | 0.09695   | 1.63801   | 7.5  | 0.78649   | 2.42433   |
| 4.2 | 0.11395   | 1.63793   | 7.6  | 0.90717   | 2.40611   |
| 4.3 | 0.13172   | 1.63912   | 7.7  | 1.02986   | 2.37737   |
| 4.4 | 0.15015   | 1.64176   | 7.8  | 1.15325   | 2.33756   |
| 4.5 | 0.16905   | 1.64602   | 7.9  | 1.27591   | 2.28630   |
| 4.6 | 0.18825   | 1.65204   | 8.0  | 1.39629   | 2.22335   |
| 4.7 | 0.20749   | 1.65999   | 8.1  | 1.51276   | 2.14864   |
| 4.8 | 0.22653   | 1.67004   | 8.2  | 1.62355   | 2.06230   |
| 4.9 | 0.24504   | 1.68232   | 8.3  | 1.72683   | 1.96466   |
| 5.0 | 0.26269   | 1.69698   | 8.4  | 1.82071   | 1.85630   |
| 5.1 | 0.27910   | 1.71414   | 8.5  | 1.90325   | 1.73801   |
| 5.2 | 0.29388   | 1.73389   | 8.6  | 1.97241   | 1.61087   |
| 5.3 | 0.30657   | 1.75633   | 8.7  | 2.02615   | 1.47610   |
| 5.4 | 0.31670   | 1.78148   | 8.8  | 2.06229   | 1.33537   |
| 5.5 | 0.32377   | 1.80939   | 8.9  | 2.07857   | 1.19052   |
| 5.6 | 0.32730   | 1.83998   | 9.0  | 2.07254   | 1.04367   |
| 5.7 | 0.32675   | 1.87322   | 9.1  | 2.04138   | 0.89722   |
| 5.8 | 0.32159   | 1.90892   |      |           |           |
| 5.9 | 0.31132   | 1.94690   | 8.90 | 2.07857   | 1.19051   |
| 6.0 | 0.29543   | 1.98688   | 8.95 | 2.07851   | 1.11719   |
| 6.1 | 0.27346   | 2.02850   | 9.00 | 2.07254   | 1.04367   |
| 6.2 | 0.24495   | 2.07136   | 9.05 | 2.06029   | 0.97023   |
| 6.3 | 0.20954   | 2.11494   | 9.10 | 2.04138   | 0.89722   |
| 6.4 | 0.16686   | 2.15869   | 9.15 | 2.01532   | 0.82496   |
| 6.5 | — 0.11668 | + 2.20193 | 9.20 | + 1.98160 | + 0.75379 |

| $t$   | $\xi$     | $\eta$    | $t$   | $\xi$     | $\eta$    |
|-------|-----------|-----------|-------|-----------|-----------|
| 9.25  | + 1.93956 | + 0.68404 | 9.400 | + 1.75415 | + 0.48626 |
| 9.30  | 1.88841   | 0.61603   | 9.425 | 1.71243   | 0.45519   |
| 9.35  | 1.82708   | 0.55005   | 9.450 | 1.66750   | 0.42464   |
| 9.40  | 1.75415   | 0.48626   | 9.475 | 1.61821   | 0.39450   |
|       |           |           | 9.500 | 1.56407   | 0.36463   |
| 9.350 | 1.82707   | 0.55003   | 9.525 | + 1.50437 | + 0.33470 |
| 9.375 | + 1.79217 | + 0.51787 |       |           |           |

| $\psi$ | $\xi$     | $\eta$    | $E$       | $F$       |
|--------|-----------|-----------|-----------|-----------|
| 0.000  | + 1.56407 | + 0.36462 | + 0.28698 | — 1.07122 |
| 0.025  | 1.46757   | 0.31759   | 0.27894   | 0.98582   |
| 0.050  | 1.37681   | 0.27817   | 0.27534   | 0.89766   |
| 0.075  | 1.29345   | 0.24387   | 0.27505   | 0.80730   |
| 0.100  | 1.21846   | 0.21280   | 0.27717   | 0.71515   |
| 0.125  | 1.15250   | 0.18355   | 0.28078   | 0.62157   |
| 0.150  | 1.09595   | 0.15517   | 0.28514   | 0.52690   |
| 0.175  | 1.04890   | 0.12705   | 0.28962   | 0.43135   |
| 0.200  | 1.01146   | 0.09886   | 0.29370   | 0.33516   |
| 0.225  | 0.98356   | 0.07047   | 0.29701   | 0.23851   |
| 0.250  | 0.96514   | 0.04187   | 0.29925   | 0.14156   |
| 0.275  | 0.95622   | + 0.01314 | 0.30023   | — 0.04443 |
| 0.300  | + 0.95670 | — 0.01559 | + 0.29984 | + 0.05275 |

## Bahn 15.

$$\eta_0 = + 1.741$$

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.0 | 0.00000   | + 1.74100 | 0.6 | + 0.00937 | + 1.74432 |
| 0.2 | + 0.00255 | 1.74235   | 0.8 | 0.01359   | 1.74466   |
| 0.4 | + 0.00568 | + 1.74349 | 1.0 | + 0.01821 | + 1.74434 |

| $t$ | $\xi$     | $\eta$    | $t$  | $\xi$     | $\eta$    |
|-----|-----------|-----------|------|-----------|-----------|
| 1.2 | + 0.02311 | + 1.74322 | 8.0  | + 1.54939 | + 2.25435 |
| 1.4 | 0.02805   | 1.74111   | 8.2  | 1.79589   | 2.07212   |
| 1.6 | 0.03277   | 1.73787   | 8.4  | 2.00913   | 1.84196   |
| 1.8 | 0.03693   | 1.73334   | 8.6  | 2.17345   | 1.57077   |
| 2.0 | 0.04010   | 1.72743   | 8.8  | 2.27305   | 1.26999   |
| 2.2 | 0.04182   | 1.72008   |      |           |           |
| 2.4 | 0.04156   | 1.71132   | 8.6  | 2.17345   | 1.57077   |
| 2.6 | 0.03878   | 1.70125   | 8.7  | 2.23233   | 1.42317   |
| 2.8 | 0.03292   | 1.69008   | 8.8  | 2.27305   | 1.26998   |
| 3.0 | 0.02341   | 1.67813   | 8.9  | 2.29367   | 1.11340   |
| 3.2 | + 0.00977 | 1.66590   | 9.0  | 2.29219   | 0.95599   |
| 3.4 | — 0.00843 | 1.65398   | 9.1  | 2.26652   | 0.80066   |
| 3.6 | 0.03149   | 1.64317   | 9.2  | 2.21433   | 0.65072   |
| 3.8 | 0.05948   | 1.63443   | 9.3  | 2.13277   | 0.50991   |
| 4.0 | 0.09227   | 1.62886   | 9.4  | 2.01780   | 0.38245   |
| 4.2 | 0.12938   | 1.62773   |      |           |           |
| 4.4 | 0.16990   | 1.63241   | 9.30 | 2.13277   | 0.50991   |
| 4.6 | 0.21247   | 1.64436   | 9.35 | 2.07980   | 0.44422   |
| 4.8 | 0.25510   | 1.66499   | 9.40 | 2.01782   | 0.38244   |
| 5.0 | 0.29519   | 1.69566   | 9.45 | 1.94591   | 0.32518   |
| 5.2 | 0.32947   | 1.73751   | 9.50 | 1.86274   | 0.27310   |
| 5.4 | 0.35409   | 1.79127   | 9.55 | 1.76636   | 0.22682   |
| 5.6 | 0.36474   | 1.85716   | 9.60 | 1.65357   | 0.18695   |
| 5.8 | 0.35687   | 1.93452   |      |           |           |
| 6.0 | 0.32593   | 2.02172   | 9.56 | 1.74524   | 0.21834   |
| 6.2 | 0.26773   | 2.11578   | 9.58 | 1.70093   | 0.20212   |
| 6.4 | 0.17877   | 2.21240   | 9.60 | 1.65357   | 0.18696   |
| 6.6 | — 0.05667 | 2.30591   | 9.62 | 1.60271   | 0.17287   |
| 6.8 | + 0.09952 | 2.38946   | 9.64 | 1.54779   | 0.15981   |
| 7.0 | 0.28892   | 2.45534   | 9.66 | 1.48799   | 0.14770   |
| 7.2 | 0.50857   | 2.49542   | 9.68 | 1.42211   | 0.13635   |
| 7.4 | 0.75319   | 2.50172   |      |           |           |
| 7.6 | 1.01516   | 2.46708   | 9.66 | 1.48799   | 0.14770   |
| 7.8 | + 1.28457 | + 2.38579 | 9.67 | + 1.45592 | + 0.14194 |

| $t$  | $\xi$     | $\eta$    | $t$  | $\xi$     | $\eta$    |
|------|-----------|-----------|------|-----------|-----------|
| 9.68 | + 1.42213 | + 0.13633 | 9.72 | + 1.26295 | + 0.11325 |
| 9.69 | 1.38638   | 0.13081   | 9.73 | 1.21388   | 0.10596   |
| 9.70 | 1.34829   | 0.12525   | 9.74 | + 1.15826 | + 0.09648 |
| 9.71 | + 1.30738 | + 0.11950 |      |           |           |

| $\psi$ | $\xi$     | $\eta$    | $E$       | $F$       |
|--------|-----------|-----------|-----------|-----------|
| 0.00   | + 1.26295 | + 0.11325 | + 0.14337 | — 0.72689 |
| 0.02   | 1.20634   | 0.10468   | 0.15052   | 0.65109   |
| 0.04   | 1.15500   | 0.09585   | 0.15863   | 0.57460   |
| 0.06   | 1.11064   | 0.08633   | 0.16733   | 0.49756   |
| 0.08   | 1.07266   | 0.07586   | 0.17629   | 0.42008   |
| 0.10   | 1.04100   | 0.06427   | 0.18523   | 0.34223   |
| 0.12   | 1.01567   | 0.05176   | 0.19393   | 0.26412   |
| 0.14   | 0.99657   | 0.03753   | 0.20222   | 0.18581   |
| 0.16   | 0.98368   | 0.02242   | 0.20995   | 0.10737   |
| 0.18   | 0.97695   | + 0.00621 | 0.21703   | — 0.02885 |
| 0.20   | 0.97636   | — 0.01101 | 0.22342   | + 0.04968 |
| 0.22   | + 0.98188 | — 0.02918 | + 0.22910 | + 0.12815 |

## Bahn 16.

$$\eta_0 = + 1.742$$

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.0 | 0.00000   | + 1.74200 | 1.4 | + 0.03120 | + 1.74198 |
| 0.2 | + 0.00284 | 1.74351   | 1.6 | 0.03639   | 1.73833   |
| 0.4 | 0.00633   | 1.74479   | 1.8 | 0.04094   | 1.73326   |
| 0.6 | 0.01046   | 1.74568   | 2.0 | 0.04438   | 1.72667   |
| 0.8 | 0.01515   | 1.74603   | 2.2 | 0.04620   | 1.71849   |
| 1.0 | 0.02030   | 1.74565   | 2.4 | 0.04581   | 1.70875   |
| 1.2 | + 0.02572 | + 1.74437 | 2.6 | + 0.04262 | + 1.69757 |

| $t$ | $\xi$    | $\eta$   | $t$ | $\xi$    | $\eta$   |
|-----|----------|----------|-----|----------|----------|
| 2.8 | +0.03600 | +1.68518 | 6.2 | —0.29529 | +2.16064 |
| 3.0 | 0.02533  | 1.67194  | 6.4 | 0.19575  | 2.26731  |
| 3.2 | +0.01006 | 1.65839  | 6.6 | —0.05970 | 2.36997  |
| 3.4 | —0.01029 | 1.64521  | 6.8 | +0.11366 | 2.46092  |
| 3.6 | 0.03603  | 1.63329  | 7.0 | 0.32317  | 2.53157  |
| 3.8 | 0.06728  | 1.62370  | 7.2 | 0.56534  | 2.57297  |
| 4.0 | 0.10385  | 1.61768  | 7.4 | 0.83419  | 2.57642  |
| 4.2 | 0.14519  | 1.61664  | 7.6 | 1.12118  | 2.53429  |
| 4.4 | 0.19032  | 1.62208  | 7.8 | 1.41540  | 2.44063  |
| 4.6 | 0.23768  | 1.63561  | 8.0 | 1.70389  | 2.29201  |
| 4.8 | 0.28504  | 1.65880  | 8.2 | 1.97196  | 2.08824  |
| 5.0 | 0.32949  | 1.69315  | 8.4 | 2.20405  | 1.83296  |
| 5.2 | 0.36735  | 1.73990  | 8.6 | 2.38441  | 1.53422  |
| 5.4 | 0.39430  | 1.79990  | 8.8 | 2.49799  | 1.20495  |
| 5.6 | 0.40556  | 1.87334  | 9.0 | 2.53128  | 0.86318  |
| 5.8 | 0.39606  | 1.95949  | 9.2 | +2.47285 | +0.53245 |
| 6.0 | —0.36082 | +2.05639 |     |          |          |

| $\psi$ | $\xi$   | $\eta$  | $E$      | $F$      |
|--------|---------|---------|----------|----------|
| 0.00   | +2.5314 | +0.8632 | +0.35190 | —1.64886 |
| 0.02   | 2.5072  | 0.6574  | 0.27667  | 1.61204  |
| 0.04   | 2.4528  | 0.4785  | 0.20960  | 1.57018  |
| 0.06   | 2.3761  | 0.3290  | 0.15113  | 1.52361  |
| 0.08   | 2.2834  | 0.2091  | 0.10140  | 1.47271  |
| 0.10   | 2.1813  | 0.1171  | 0.06030  | 1.41788  |
| 0.12   | 2.0748  | 0.0500  | 0.02752  | 1.35954  |
| 0.14   | 1.9677  | +0.0043 | +0.00255 | 1.29810  |
| 0.16   | 1.8627  | —0.0239 | —0.01521 | 1.23396  |
| 0.18   | 1.7519  | 0.0384  | 0.02646  | 1.16750  |
| 0.20   | 1.6664  | 0.0426  | 0.03190  | 1.09906  |
| 0.22   | 1.5769  | 0.0394  | 0.03229  | 1.02897  |
| 0.24   | +1.4939 | —0.0314 | —0.02832 | —0.95748 |

| $\psi$ | $\xi$    | $\eta$   | $E$       | $F$       |
|--------|----------|----------|-----------|-----------|
| 0.26   | + 1.4174 | — 0.0208 | — 0.02067 | — 0.88483 |
| 0.28   | 1.3474   | — 0.0090 | — 0.00998 | 0.81122   |
| 0.30   | 1.2839   | + 0.0026 | + 0.00318 | 0.73682   |
| 0.32   | 1.2269   | 0.0130   | 0.01826   | 0.66177   |
| 0.34   | 1.1760   | 0.0216   | 0.03480   | 0.58617   |
| 0.36   | 1.1314   | 0.0279   | 0.05237   | 0.51012   |
| 0.38   | 1.0928   | 0.0316   | 0.07062   | 0.43371   |
| 0.40   | 1.0602   | 0.0325   | 0.08921   | 0.35700   |
| 0.42   | 1.0334   | 0.0306   | 0.10788   | 0.28005   |
| 0.44   | 1.0125   | 0.0258   | 0.12642   | 0.20292   |
| 0.46   | 0.9974   | 0.0182   | 0.14463   | 0.12565   |
| 0.48   | 0.9880   | + 0.0098 | 0.16239   | — 0.04830 |
| 0.50   | 0.9843   | — 0.0052 | 0.17960   | + 0.02906 |
| 0.52   | + 0.9864 | — 0.0208 | + 0.19621 | + 0.10632 |

## Bahn 17.

$$\eta_0 = +1.743$$

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.0 | 0.00000   | + 1.74300 | 1.4 | + 0.03429 | + 1.74298 |
| 0.1 | + 0.00148 | 1.74386   | 1.5 | 0.03721   | 1.74115   |
| 0.2 | 0.00313   | 1.74467   | 1.6 | 0.04000   | 1.73896   |
| 0.3 | 0.00496   | 1.74542   | 1.7 | 0.04261   | 1.73638   |
| 0.4 | 0.00697   | 1.74608   | 1.8 | 0.04499   | 1.73339   |
| 0.5 | 0.00916   | 1.74663   | 1.9 | 0.04706   | 1.72998   |
| 0.6 | 0.01151   | 1.74706   | 2.0 | 0.04876   | 1.72614   |
| 0.7 | 0.01402   | 1.74734   | 2.1 | 0.05002   | 1.72187   |
| 0.8 | 0.01667   | 1.74744   | 2.2 | 0.05075   | 1.71716   |
| 0.9 | 0.01944   | 1.74734   | 2.3 | 0.05088   | 1.71202   |
| 1.0 | 0.02233   | 1.74702   | 2.4 | 0.05033   | 1.70647   |
| 1.1 | 0.02528   | 1.74645   | 2.5 | 0.04900   | 1.70052   |
| 1.2 | 0.02829   | 1.74560   | 2.6 | 0.04682   | 1.69420   |
| 1.3 | + 0.03131 | + 1.74445 | 2.7 | + 0.04370 | + 1.68754 |

| $t$ | $\xi$    | $\eta$   | $t$ | $\xi$    | $\eta$   |
|-----|----------|----------|-----|----------|----------|
| 2.8 | +0.03955 | +1.68059 | 6.3 | -0.27952 | +2.26139 |
| 2.9 | 0.03429  | 1.67341  | 6.4 | 0.22023  | 2.31997  |
| 3.0 | 0.02784  | 1.66605  | 6.5 | 0.15094  | 2.37741  |
| 3.1 | 0.02012  | 1.65861  | 6.6 | -0.07147 | 2.43267  |
| 3.2 | 0.01107  | 1.65116  | 6.7 | +0.01821 | 2.48465  |
| 3.3 | +0.00062 | 1.64380  | 6.8 | 0.11801  | 2.53217  |
| 3.4 | -0.01127 | 1.63666  | 6.9 | 0.22767  | 2.57402  |
| 3.5 | 0.02466  | 1.62986  | 7.0 | 0.34680  | 2.60898  |
| 3.6 | 0.03955  | 1.62353  | 7.1 | 0.47480  | 2.63580  |
| 3.7 | 0.05597  | 1.61783  | 7.2 | 0.61096  | 2.65329  |
| 3.8 | 0.07390  | 1.61292  | 7.3 | 0.75434  | 2.66027  |
| 3.9 | 0.09331  | 1.60899  | 7.4 | 0.90388  | 2.65567  |
| 4.0 | 0.11414  | 1.60621  | 7.5 | 1.05832  | 2.63848  |
| 4.1 | 0.13632  | 1.60479  | 7.6 | 1.21624  | 2.60785  |
| 4.2 | 0.15972  | 1.60493  | 7.7 | 1.37610  | 2.56306  |
| 4.3 | 0.18419  | 1.60684  | 7.8 | 1.53621  | 2.50355  |
| 4.4 | 0.20955  | 1.61076  | 7.9 | 1.69476  | 2.42900  |
| 4.5 | 0.23555  | 1.61688  | 8.0 | 1.84983  | 2.33926  |
| 4.6 | 0.26193  | 1.62544  | 8.1 | 1.99946  | 2.23447  |
| 4.7 | 0.28835  | 1.63666  | 8.2 | 2.14162  | 2.11500  |
| 4.8 | 0.31443  | 1.65074  | 8.3 | 2.27428  | 1.98150  |
| 4.9 | 0.33974  | 1.66790  | 8.4 | 2.39540  | 1.83492  |
| 5.0 | 0.36379  | 1.68831  | 8.5 | 2.50301  | 1.67651  |
| 5.1 | 0.38605  | 1.71215  | 8.6 | 2.59525  | 1.50783  |
| 5.2 | 0.40595  | 1.73955  | 8.7 | 2.67034  | 1.33074  |
| 5.3 | 0.42285  | 1.77063  | 8.8 | 2.72671  | 1.14743  |
| 5.4 | 0.43612  | 1.80544  | 8.9 | 2.76298  | 0.96038  |
| 5.5 | 0.44506  | 1.84399  | 9.0 | 2.77802  | 0.77240  |
| 5.6 | 0.44898  | 1.88621  | 9.1 | 2.77098  | 0.58657  |
| 5.7 | 0.44719  | 1.93198  | 9.2 | 2.74131  | 0.40624  |
| 5.8 | 0.43898  | 1.98106  | 9.3 | 2.68882  | 0.23507  |
| 5.9 | 0.42369  | 2.03314  | 9.4 | 2.61364  | +0.07696 |
| 6.0 | 0.40067  | 2.08780  | 9.5 | 2.51620  | -0.06386 |
| 6.1 | 0.36931  | 2.14451  | 9.6 | 2.39722  | 0.18282  |
| 6.2 | -0.32909 | +2.20262 | 9.7 | +2.25749 | -0.27484 |

| $\psi$ | $\xi$     | $\eta$    | $E$       | $F$       |
|--------|-----------|-----------|-----------|-----------|
| 0.000  | + 2.51618 | — 0.06386 | + 0.02765 | + 1.57426 |
| 0.025  | 2.36444   | 0.20837   | 0.09685   | 1.51082   |
| 0.050  | 2.20705   | 0.29829   | 0.15004   | 1.44166   |
| 0.075  | 2.05367   | 0.34305   | 0.18797   | 1.36771   |
| 0.100  | 1.91026   | 0.35292   | 0.21183   | 1.28990   |
| 0.125  | 1.77921   | 0.33751   | 0.22303   | 1.20906   |
| 0.150  | 1.66142   | 0.30519   | 0.22310   | 1.12589   |
| 0.175  | 1.55639   | 0.26275   | 0.21361   | 1.04100   |
| 0.200  | 1.46300   | 0.21556   | 0.19603   | 0.95483   |
| 0.225  | 1.38006   | 0.16764   | 0.17177   | 0.86772   |
| 0.250  | 1.30659   | 0.12201   | 0.14210   | 0.77996   |
| 0.275  | 1.24157   | 0.08078   | 0.10819   | 0.69164   |
| 0.300  | 1.18432   | 0.04545   | 0.07106   | 0.60290   |
| 0.325  | 1.13433   | — 0.01698 | + 0.03164 | 0.51379   |
| 0.350  | 1.09135   | + 0.00406 | — 0.00928 | 0.42436   |
| 0.375  | 1.05515   | 0.01738   | 0.05101   | 0.33464   |
| 0.400  | 1.02563   | 0.02294   | 0.09296   | 0.24468   |
| 0.425  | 1.00279   | 0.02083   | 0.13466   | 0.15453   |
| 0.450  | 0.98664   | + 0.01124 | 0.17571   | + 0.06427 |
| 0.475  | 0.97712   | — 0.00557 | 0.21585   | — 0.02600 |
| 0.500  | 0.97425   | 0.02935   | 0.25489   | 0.11614   |
| 0.525  | + 0.97790 | — 0.05986 | — 0.29274 | — 0.20598 |

Bahn 18.

$$\eta_0 = + 1.744$$

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.0 | + 0.00000 | + 1.74400 | 1.0 | + 0.02442 | + 1.74843 |
| 0.2 | 0.00341   | 1.74583   | 1.2 | 0.03095   | 1.74689   |
| 0.4 | 0.00761   | 1.74737   | 1.4 | 0.03753   | 1.74403   |
| 0.6 | 0.01258   | 1.74846   | 1.6 | 0.04377   | 1.73965   |
| 0.8 | + 0.01822 | + 1.74888 | 1.8 | + 0.04924 | + 1.73357 |

| $l$ | $\xi$    | $\eta$   | $l$ | $\xi$    | $\eta$   |
|-----|----------|----------|-----|----------|----------|
| 2.0 | +0.05338 | +1.72565 | 6.0 | -0.44416 | +2.11971 |
| 2.2 | 0.05557  | 1.71583  | 6.2 | 0.36659  | 2.24565  |
| 2.4 | 0.05513  | 1.70414  | 6.4 | 0.24837  | 2.37427  |
| 2.6 | 0.05133  | 1.69072  | 6.6 | -0.08671 | 2.49762  |
| 2.8 | 0.04340  | 1.67582  | 6.8 | +0.11918 | 2.60623  |
| 3.0 | 0.03063  | 1.65989  | 7.0 | 0.36765  | 2.68970  |
| 3.2 | +0.01231 | 1.64356  | 7.2 | 0.65434  | 2.73730  |
| 3.4 | -0.01211 | 1.62766  | 7.4 | 0.97199  | 2.73880  |
| 3.6 | 0.04303  | 1.61322  | 7.6 | 1.31044  | 2.68534  |
| 3.8 | 0.08066  | 1.60151  | 7.8 | 1.65693  | 2.57020  |
| 4.0 | 0.12479  | 1.59402  | 8.0 | 1.99654  | 2.38976  |
| 4.2 | 0.17484  | 1.59243  | 8.2 | 2.31290  | 2.14415  |
| 4.4 | 0.22967  | 1.59858  | 8.4 | 2.58915  | 1.83788  |
| 4.6 | 0.28743  | 1.61438  | 8.6 | 2.80909  | 1.48027  |
| 4.8 | 0.34545  | 1.64177  | 8.8 | 2.95852  | 1.08553  |
| 5.0 | 0.40014  | 1.68258  | 9.0 | 3.02669  | 0.67247  |
| 5.2 | 0.44702  | 1.73839  | 9.2 | 3.00770  | +0.26388 |
| 5.4 | 0.48081  | 1.81033  | 9.4 | 2.90184  | -0.11455 |
| 5.6 | 0.49563  | 1.89870  | 9.6 | 2.71642  | 0.43561  |
| 5.8 | -0.48538 | +2.00265 | 9.8 | +2.46620 | -0.67193 |

| $\psi$ | $\xi$    | $\eta$   | $E$      | $F$      |
|--------|----------|----------|----------|----------|
| 0.00   | +2.46620 | -0.67193 | +0.28752 | +1.59762 |
| 0.02   | 2.31111  | 0.75502  | 0.34353  | 1.54671  |
| 0.04   | 2.16385  | 0.79822  | 0.38749  | 1.49281  |
| 0.06   | 2.02900  | 0.80880  | 0.41986  | 1.43654  |
| 0.08   | 1.90817  | 0.79376  | 0.44130  | 1.37847  |
| 0.10   | 1.80204  | 0.75933  | 0.45260  | 1.31913  |
| 0.12   | 1.70961  | 0.71087  | 0.45459  | 1.25898  |
| 0.14   | 1.62970  | 0.65280  | 0.44814  | 1.19841  |
| 0.16   | 1.56057  | 0.58866  | 0.43411  | 1.13773  |
| 0.18   | +1.50048 | -0.52127 | +0.41331 | +1.07715 |

| $\psi$ | $\xi$     | $\eta$    | $E$       | $F$       |
|--------|-----------|-----------|-----------|-----------|
| 0.20   | + 1.44780 | — 0.45289 | + 0.38652 | + 1.01686 |
| 0.22   | 1.40100   | 0.38521   | 0.35448   | 0.95693   |
| 0.24   | 1.35878   | 0.31968   | 0.31788   | 0.89741   |
| 0.26   | 1.32000   | 0.25737   | 0.27734   | 0.83831   |
| 0.28   | 1.28374   | 0.19920   | 0.23348   | 0.77958   |
| 0.30   | 1.24937   | 0.14588   | 0.18683   | 0.72118   |
| 0.32   | 1.21631   | 0.09800   | 0.13794   | 0.66304   |
| 0.34   | 1.18419   | 0.05602   | 0.08727   | 0.60509   |
| 0.36   | 1.15282   | — 0.02028 | + 0.03527 | 0.54725   |
| 0.38   | 1.12203   | + 0.00898 | — 0.01763 | 0.48947   |
| 0.40   | 1.09190   | 0.03090   | 0.07107   | 0.43172   |
| 0.42   | 1.06242   | 0.04760   | 0.12470   | 0.37395   |
| 0.44   | 1.03374   | 0.05698   | 0.17820   | 0.31616   |
| 0.46   | 1.00605   | 0.05990   | 0.23132   | 0.25837   |
| 0.48   | 0.97938   | 0.05655   | 0.28383   | 0.20061   |
| 0.50   | 0.95385   | 0.04724   | 0.33568   | 0.14293   |
| 0.52   | 0.92972   | 0.03221   | 0.38623   | 0.08539   |
| 0.54   | 0.90688   | + 0.01186 | 0.43586   | + 0.02809 |
| 0.56   | + 0.88536 | — 0.01345 | — 0.48431 | — 0.02889 |

## Bahn 19.

$$\eta_0 = + 1.745$$

| $t$   | $\xi$     | $\eta$    | $t$   | $\xi$     | $\eta$    |
|-------|-----------|-----------|-------|-----------|-----------|
| 0.000 | 0.00000   | + 1.74500 | 1.000 | + 0.02639 | + 1.74974 |
| 0.125 | + 0.00221 | 1.74626   | 1.125 | 0.03077   | 1.74884   |
| 0.250 | 0.00476   | 1.74743   | 1.250 | 0.03522   | 1.74743   |
| 0.375 | 0.00763   | 1.74845   | 1.375 | 0.03965   | 1.74543   |
| 0.500 | 0.01083   | 1.74929   | 1.500 | 0.04396   | 1.74281   |
| 0.625 | 0.01434   | 1.74989   | 1.625 | 0.04805   | 1.73950   |
| 0.750 | 0.01812   | 1.75020   | 1.750 | 0.05178   | 1.73546   |
| 0.875 | + 0.02216 | + 1.75017 | 1.875 | + 0.05501 | + 1.73066 |

| $t$   | $\xi$     | $\eta$    | $t$    | $\xi$     | $\eta$    |
|-------|-----------|-----------|--------|-----------|-----------|
| 2.000 | + 0.05759 | + 1.72507 | 6.250  | — 0.37123 | + 2.32288 |
| 2.125 | 0.05934   | 1.71867   | 6.375  | 0.28970   | 2.40980   |
| 2.250 | 0.06010   | 1.71148   | 6.500  | 0.18999   | 2.49485   |
| 2.375 | 0.05966   | 1.70351   | 6.625  | — 0.07174 | 2.57560   |
| 2.500 | 0.05785   | 1.69478   | 6.750  | + 0.06504 | 2.64944   |
| 2.625 | 0.05445   | 1.68538   | 6.875  | 0.21995   | 2.71361   |
| 2.750 | 0.04928   | 1.67537   | 7.000  | 0.39212   | 2.76526   |
| 2.875 | 0.04213   | 1.66487   | 7.125  | 0.58023   | 2.80158   |
| 3.000 | 0.03281   | 1.65402   | 7.250  | 0.78249   | 2.81984   |
| 3.125 | 0.02116   | 1.64299   | 7.375  | 0.99664   | 2.81748   |
| 3.250 | + 0.00701 | 1.63200   | 7.500  | 1.21993   | 2.79222   |
| 3.375 | — 0.00978 | 1.62128   | 7.625  | 1.44923   | 2.74212   |
| 3.500 | 0.02931   | 1.61110   | 7.750  | 1.68099   | 2.66569   |
| 3.625 | 0.05166   | 1.60180   | 7.875  | 1.91134   | 2.56194   |
| 3.750 | 0.07684   | 1.59371   | 8.000  | 2.13620   | 2.43048   |
| 3.875 | 0.10483   | 1.58724   | 8.125  | 2.35130   | 2.27159   |
| 4.000 | 0.13544   | 1.58280   | 8.250  | 2.55233   | 2.08623   |
| 4.125 | 0.16878   | 1.58086   | 8.375  | 2.73505   | 1.87611   |
| 4.250 | 0.20429   | 1.58188   | 8.500  | 2.89541   | 1.64367   |
| 4.375 | 0.24170   | 1.58636   | 8.625  | 3.02969   | 1.39214   |
| 4.500 | 0.28050   | 1.59482   | 8.750  | 3.13465   | 1.12543   |
| 4.625 | 0.32006   | 1.60775   | 8.875  | 3.20768   | 0.84812   |
| 4.750 | 0.35960   | 1.62568   | 9.000  | 3.24691   | 0.56534   |
| 4.875 | 0.39818   | 1.64909   | 9.125  | 3.25136   | 0.28265   |
| 5.000 | 0.43469   | 1.67845   | 9.250  | 3.22103   | + 0.00590 |
| 5.125 | 0.46789   | 1.71416   | 9.375  | 3.15702   | — 0.25894 |
| 5.250 | 0.49641   | 1.75658   | 9.500  | 3.06144   | 0.50596   |
| 5.375 | 0.51877   | 1.80594   | 9.625  | 2.93756   | 0.72957   |
| 5.500 | 0.53339   | 1.86231   | 9.750  | 2.78965   | 0.92463   |
| 5.625 | 0.53869   | 1.92556   | 9.875  | 2.62292   | 1.08658   |
| 5.750 | 0.53305   | 1.99537   | 10.000 | 2.44342   | 1.21167   |
| 5.875 | 0.51490   | 2.07109   | 10.125 | 2.25784   | 1.29696   |
| 6.000 | 0.48276   | 2.15179   | 10.250 | 2.07335   | 1.34039   |
| 6.125 | — 0.43526 | + 2.23624 | 10.375 | + 1.89742 | — 1.34068 |

| $t$    | $\xi$     | $\eta$    | $t$    | $\xi$     | $\eta$    |
|--------|-----------|-----------|--------|-----------|-----------|
| 10.500 | + 1.73759 | — 1.29712 | 10.750 | + 1.49531 | — 1.07540 |
| 10.625 | + 1.60125 | — 1.20913 | 10.875 | + 1.42539 | — 0.89190 |

## Bahn 20.

$$\eta_0 = + 1.746$$

| $t$   | $\xi$     | $\eta$    | $t$   | $\xi$     | $\eta$    |
|-------|-----------|-----------|-------|-----------|-----------|
| 0.000 | 0.00000   | + 1.74600 | 3.125 | + 0.02289 | + 1.63604 |
| 0.125 | + 0.00238 | 1.74736   | 3.250 | + 0.00764 | 1.62416   |
| 0.250 | 0.00512   | 1.74861   | 3.375 | — 0.01046 | 1.61256   |
| 0.375 | 0.00822   | 1.74971   | 3.500 | 0.03153   | 1.60155   |
| 0.500 | 0.01166   | 1.75062   | 3.625 | 0.05565   | 1.59147   |
| 0.625 | 0.01544   | 1.75127   | 3.750 | 0.08285   | 1.58269   |
| 0.750 | 0.01952   | 1.75161   | 3.875 | 0.11310   | 1.57564   |
| 0.875 | 0.02386   | 1.75158   | 4.000 | 0.14630   | 1.57078   |
| 1.000 | 0.02843   | 1.75112   | 4.125 | 0.18239   | 1.56857   |
| 1.125 | 0.03315   | 1.75015   | 4.250 | 0.22076   | 1.56958   |
| 1.250 | 0.03794   | 1.74863   | 4.375 | 0.26133   | 1.57430   |
| 1.375 | 0.04272   | 1.74649   | 4.500 | 0.30346   | 1.58327   |
| 1.500 | 0.04737   | 1.74366   | 4.625 | 0.34645   | 1.59707   |
| 1.625 | 0.05178   | 1.74010   | 4.750 | 0.38947   | 1.61623   |
| 1.750 | 0.05581   | 1.73575   | 4.875 | 0.43148   | 1.64130   |
| 1.875 | 0.05929   | 1.73058   | 5.000 | 0.47129   | 1.67278   |
| 2.000 | 0.06208   | 1.72456   | 5.125 | 0.50754   | 1.71115   |
| 2.125 | 0.06397   | 1.71768   | 5.250 | 0.53873   | 1.75679   |
| 2.250 | 0.06479   | 1.70992   | 5.375 | 0.56324   | 1.80997   |
| 2.375 | 0.06434   | 1.70133   | 5.500 | 0.57940   | 1.87077   |
| 2.500 | 0.06239   | 1.69193   | 5.625 | 0.58545   | 1.93908   |
| 2.625 | 0.05874   | 1.68179   | 5.750 | 0.57968   | 2.01451   |
| 2.750 | 0.05317   | 1.67099   | 5.875 | 0.56041   | 2.09637   |
| 2.875 | 0.04548   | 1.65966   | 6.000 | 0.52605   | 2.18364   |
| 3.000 | + 0.03545 | + 1.64795 | 6.125 | — 0.47515 | + 2.27492 |

| $t$   | $\xi$     | $\eta$    | $t$    | $\xi$     | $\eta$    |
|-------|-----------|-----------|--------|-----------|-----------|
| 6.250 | —0.40644  | + 2.36851 | 8.875  | + 3.42351 | + 0.76315 |
| 6.375 | 0.31893   | 2.46234   | 9.000  | 3.46854   | 0.45477   |
| 6.500 | 0.21191   | 2.55404   | 9.125  | 3.47746   | + 0.14462 |
| 6.625 | —0.08502  | 2.64098   | 9.250  | 3.45026   | —0.16154  |
| 6.750 | + 0.06170 | 2.72030   | 9.375  | 3.38796   | 0.45841   |
| 6.875 | 0.22777   | 2.78902   | 9.500  | 3.29256   | 0.74023   |
| 7.000 | 0.41224   | 2.84401   | 9.625  | 3.16704   | 1.00203   |
| 7.125 | 0.61366   | 2.88253   | 8.750  | 3.01523   | 1.23932   |
| 7.250 | 0.83010   | 2.90136   | 9.875  | 2.84178   | 1.44828   |
| 7.375 | 1.05909   | 2.89789   | 10.000 | 2.65191   | 1.62596   |
| 7.500 | 1.29771   | 2.86951   | 10.125 | 2.45132   | 1.77032   |
| 7.625 | 1.54258   | 2.81468   | 10.250 | 2.24597   | 1.88031   |
| 7.750 | 1.78993   | 2.73134   | 10.375 | 2.04189   | 1.95587   |
| 7.875 | 2.03567   | 2.61862   | 10.500 | 1.84506   | 1.99809   |
| 8.000 | 2.27545   | 2.47612   | 10.625 | 1.66117   | 2.00839   |
| 8.125 | 2.50481   | 2.30414   | 10.750 | 1.49550   | 1.98953   |
| 8.250 | 2.71821   | 2.10371   | 10.875 | 1.35286   | 1.94490   |
| 8.375 | 2.91426   | 1.87660   | 11.000 | 1.23737   | 1.87821   |
| 8.500 | 3.08575   | 1.62536   | 11.125 | 1.15242   | 1.79365   |
| 8.625 | 3.22987   | 1.35329   | 11.250 | 1.11069   | 1.69565   |
| 8.750 | + 3.34333 | + 1.06435 | 11.375 | + 1.08612 | —1.58857  |

| $\psi$ | $\xi$     | $\eta$   | $E$       | $F$       |
|--------|-----------|----------|-----------|-----------|
| 0.00   | + 1.23737 | —1.87822 | + 1.03092 | + 1.52537 |
| 0.01   | 1.19660   | 1.84348  | 1.03926   | 1.50393   |
| 0.02   | 1.16303   | 1.80725  | 1.04484   | 1.48304   |
| 0.03   | 1.13614   | 1.77005  | 1.04782   | 1.46276   |
| 0.04   | 1.11536   | 1.73232  | 1.04834   | 1.44318   |
| 0.05   | 1.10023   | 1.69441  | 1.04654   | 1.42437   |
| 0.06   | 1.09025   | 1.65663  | 1.04255   | 1.40639   |
| 0.07   | 1.08497   | 1.61915  | 1.03650   | 1.38928   |
| 0.08   | + 1.08400 | —1.58217 | + 1.02853 | + 1.37312 |

| $\psi$ | $\xi$     | $\eta$    | $E$       | $F$       |
|--------|-----------|-----------|-----------|-----------|
| 0.09   | + 1.08697 | — 1.54579 | + 1.01875 | + 1.35793 |
| 0.10   | 1.09352   | 1.51011   | 1.00728   | 1.34377   |
| 0.11   | 1.10336   | 1.47519   | 0.99423   | 1.33068   |
| 0.12   | 1.11622   | 1.44104   | 0.97970   | 1.31869   |
| 0.13   | 1.13183   | 1.40769   | 0.96380   | 1.30782   |
| 0.14   | 1.15000   | 1.37516   | 0.94662   | 1.29813   |
| 0.15   | 1.17052   | 1.34340   | 0.92826   | 1.28963   |
| 0.16   | 1.19325   | 1.31239   | 0.90881   | 1.28234   |
| 0.17   | 1.21800   | 1.28212   | 0.88835   | 1.27630   |
| 0.18   | 1.24465   | 1.25255   | 0.86699   | 1.27152   |
| 0.19   | 1.27308   | 1.22364   | 0.84480   | 1.26804   |
| 0.20   | 1.30319   | 1.19537   | 0.82187   | 1.26586   |
| 0.21   | 1.33492   | 1.16771   | 0.79831   | 1.26503   |
| 0.22   | 1.36819   | 1.14061   | 0.77418   | 1.26555   |
| 0.23   | 1.40296   | 1.11404   | 0.74957   | 1.26745   |
| 0.24   | 1.43920   | 1.08801   | 0.72459   | 1.27076   |
| 0.25   | 1.47691   | 1.06248   | 0.69931   | 1.27550   |
| 0.26   | 1.51610   | 1.03748   | 0.67385   | 1.28171   |
| 0.27   | + 1.55679 | — 1.01300 | + 0.64830 | + 1.28942 |

## Bahn 21.

$$\eta_0 = +1.7474$$

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.0 | 0.00000   | + 1.74740 | 0.8 | + 0.02335 | + 1.75360 |
| 0.1 | + 0.00207 | 1.74860   | 0.9 | 0.02724   | 1.75346   |
| 0.2 | 0.00439   | 1.74974   | 1.0 | 0.03127   | 1.75301   |
| 0.3 | 0.00696   | 1.75078   | 1.1 | 0.03540   | 1.75220   |
| 0.4 | 0.00977   | 1.75170   | 1.2 | 0.03961   | 1.75102   |
| 0.5 | 0.01283   | 1.75248   | 1.3 | 0.04382   | 1.74940   |
| 0.6 | 0.01613   | 1.75307   | 1.4 | 0.04800   | 1.74734   |
| 0.7 | + 0.01964 | + 1.75346 | 1.5 | + 0.05208 | + 1.74479 |

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 1.6 | + 0.05597 | + 1.74172 | 5.0 | — 0.52251 | + 1.66517 |
| 1.7 | 0.05962   | 1.73810   | 5.1 | 0.55525   | 1.69816   |
| 1.8 | 0.06294   | 1.73392   | 5.2 | 0.58464   | 1.73624   |
| 1.9 | 0.06583   | 1.72915   | 5.3 | 0.60978   | 1.77962   |
| 2.0 | 0.06820   | 1.72378   | 5.4 | 0.62971   | 1.82840   |
| 2.1 | 0.06994   | 1.71780   | 5.5 | 0.64349   | 1.88261   |
| 2.2 | 0.07096   | 1.71121   | 5.6 | 0.65013   | 1.94219   |
| 2.3 | 0.07113   | 1.70401   | 5.7 | 0.64867   | 2.00692   |
| 2.4 | 0.07035   | 1.69623   | 5.8 | 0.63816   | 2.07648   |
| 2.5 | 0.06848   | 1.68790   | 5.9 | 0.61767   | 2.15035   |
| 2.6 | 0.06542   | 1.67903   | 6.0 | 0.58634   | 2.22789   |
| 2.7 | 0.06105   | 1.66969   | 6.1 | 0.54339   | 2.30827   |
| 2.8 | 0.05523   | 1.65994   | 6.2 | 0.48810   | 2.39053   |
| 2.9 | 0.04785   | 1.64985   | 6.3 | 0.41986   | 2.47351   |
| 3.0 | 0.03881   | 1.63951   | 6.4 | 0.33822   | 2.55595   |
| 3.1 | 0.02798   | 1.62903   | 6.5 | 0.24285   | 2.63643   |
| 3.2 | 0.01528   | 1.61853   | 6.6 | 0.13358   | 2.71344   |
| 3.3 | + 0.00061 | 1.60814   | 6.7 | — 0.01042 | 2.78536   |
| 3.4 | — 0.01612 | 1.59803   | 6.8 | + 0.12640 | 2.85054   |
| 3.5 | 0.03495   | 1.58838   | 6.9 | 0.27646   | 2.90724   |
| 3.6 | 0.05594   | 1.57936   | 7.0 | 0.43913   | 2.95377   |
| 3.7 | 0.07912   | 1.57121   | 7.1 | 0.61355   | 2.98842   |
| 3.8 | 0.10448   | 1.56415   | 7.2 | 0.79864   | 3.00954   |
| 3.9 | 0.13200   | 1.55842   | 7.3 | 0.99308   | 3.01560   |
| 4.0 | 0.16160   | 1.55428   | 7.4 | 1.19537   | 3.00514   |
| 4.1 | 0.19320   | 1.55202   | 7.5 | 1.40378   | 2.97688   |
| 4.2 | 0.22664   | 1.55191   | 7.6 | 1.61638   | 2.92973   |
| 4.3 | 0.26173   | 1.55426   | 7.7 | 1.83111   | 2.86278   |
| 4.4 | 0.29820   | 1.55936   | 7.8 | 2.04574   | 2.77540   |
| 4.5 | 0.33572   | 1.56752   | 7.9 | 2.25792   | 2.66720   |
| 4.6 | 0.37391   | 1.57906   | 8.0 | 2.46524   | 2.53806   |
| 4.7 | 0.41227   | 1.59429   | 8.1 | 2.66521   | 2.38821   |
| 4.8 | 0.45027   | 1.61352   | 8.2 | 2.85538   | 2.21816   |
| 4.9 | — 0.48725 | + 1.63704 | 8.3 | + 3.03332 | + 2.02875 |

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 8.4 | + 3.19666 | + 1.82115 | 9.0 | + 3.76136 | + 0.29551 |
| 8.5 | 3.34320   | 1.59682   | 9.1 | 3.77357   | + 0.01660 |
| 8.6 | 3.47091   | 1.35755   | 9.2 | 3.76074   | — 0.26212 |
| 8.7 | 3.57797   | 1.10539   | 9.3 | 3.72308   | 0.53782   |
| 8.8 | 3.66283   | 0.84263   | 9.4 | 3.66118   | 0.80771   |
| 8.9 | + 3.72426 | + 0.57178 | 9.5 | + 3.57599 | — 1.06915 |

Bahn 22.  
Periodische Bahn V.

$$\eta_0 = + 1.747552$$

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.0 | 0.00000   | + 1.74755 | 2.0 | + 0.06989 | + 1.72370 |
| 0.1 | + 0.00209 | 1.74876   | 2.1 | 0.07065   | 1.71766   |
| 0.2 | 0.00443   | 1.74991   | 2.2 | 0.07168   | 1.71100   |
| 0.3 | 0.00702   | 1.75096   | 2.3 | 0.07185   | 1.70374   |
| 0.4 | 0.00987   | 1.75190   | 2.4 | 0.07106   | 1.69588   |
| 0.5 | 0.01296   | 1.75268   | 2.5 | 0.06918   | 1.68746   |
| 0.6 | 0.01629   | 1.75328   | 2.6 | 0.06609   | 1.67851   |
| 0.7 | 0.01984   | 1.75367   | 2.7 | 0.06167   | 1.66908   |
| 0.8 | 0.02358   | 1.75382   | 2.8 | 0.05579   | 1.65923   |
| 0.9 | 0.02751   | 1.75368   | 2.9 | 0.04835   | 1.64904   |
| 1.0 | 0.03158   | 1.75322   | 3.0 | 0.03922   | 1.63860   |
| 1.1 | 0.03576   | 1.75241   | 3.1 | 0.02828   | 1.62801   |
| 1.2 | 0.04001   | 1.75121   | 3.2 | 0.01546   | 1.61740   |
| 1.3 | 0.04427   | 1.74958   | 3.3 | + 0.00064 | 1.60691   |
| 1.4 | 0.04848   | 1.74750   | 3.4 | — 0.01625 | 1.59670   |
| 1.5 | 0.05260   | 1.74492   | 3.5 | 0.03527   | 1.58694   |
| 1.6 | 0.05656   | 1.74182   | 3.6 | 0.05647   | 1.57784   |
| 1.7 | 0.06022   | 1.73817   | 3.7 | 0.07988   | 1.56960   |
| 1.8 | 0.06357   | 1.73394   | 3.8 | 0.10550   | 1.56246   |
| 1.9 | + 0.06649 | + 1.72913 | 3.9 | — 0.13329 | + 1.55666 |

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 4.0 | — 0.16320 | + 1.55247 | 6.7 | — 0.01215 | + 2.79560 |
| 4.1 | 0.19513   | 1.55017   | 6.8 | + 0.12588 | 2.86140   |
| 4.2 | 0.22892   | 1.55004   | 6.9 | 0.27728   | 2.91865   |
| 4.3 | 0.26438   | 1.55239   | 7.0 | 0.44139   | 2.96560   |
| 4.4 | 0.30124   | 1.55752   | 7.1 | 0.61735   | 3.00055   |
| 4.5 | 0.33918   | 1.56574   | 7.2 | 0.80406   | 3.02184   |
| 4.6 | 0.37779   | 1.57737   | 7.3 | 1.00020   | 3.02789   |
| 4.7 | 0.41658   | 1.59272   | 7.4 | 1.20425   | 3.01726   |
| 4.8 | 0.45501   | 1.61210   | 7.5 | 1.41445   | 2.98867   |
| 4.9 | 0.49242   | 1.63583   | 7.6 | 1.62888   | 2.94098   |
| 5.0 | 0.52808   | 1.66420   | 7.7 | 1.84544   | 2.87331   |
| 5.1 | 0.56121   | 1.69749   | 7.8 | 2.06189   | 2.78500   |
| 5.2 | 0.59096   | 1.73593   | 7.9 | 2.27586   | 2.67567   |
| 5.3 | 0.61640   | 1.77971   | 8.0 | 2.48491   | 2.54521   |
| 5.4 | 0.63659   | 1.82896   | 8.1 | 2.68657   | 2.39383   |
| 5.5 | 0.65056   | 1.88370   | 8.2 | 2.87832   | 2.22205   |
| 5.6 | 0.65733   | 1.94387   | 8.3 | 3.05774   | 2.03071   |
| 5.7 | 0.65591   | 2.00925   | 8.4 | 3.22245   | 1.82098   |
| 5.8 | 0.64535   | 2.07951   | 8.5 | 3.37022   | 1.59436   |
| 5.9 | 0.62472   | 2.15414   | 8.6 | 3.49901   | 1.35260   |
| 6.0 | 0.59315   | 2.23247   | 8.7 | 3.60699   | 1.09778   |
| 6.1 | 0.54983   | 2.31368   | 8.8 | 3.69260   | 0.83219   |
| 6.2 | 0.49406   | 2.39678   | 8.9 | 3.75459   | 0.55835   |
| 6.3 | 0.42524   | 2.48062   | 9.0 | 3.79204   | + 0.27892 |
| 6.4 | 0.34288   | 2.56389   | 9.1 | 3.80439   | — 0.00332 |
| 6.5 | 0.24665   | 2.64519   | 9.2 | + 3.79146 | — 0.28552 |
| 6.6 | — 0.13640 | + 2.72296 |     |           |           |

## Bahn 23.

$$\eta_0 = + 1.74765$$

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.0 | 0.00000   | + 1.74765 | 0.2 | + 0.00446 | + 1.75003 |
| 0.1 | + 0.00210 | + 1.74887 | 0.3 | + 0.00707 | + 1.75109 |

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.4 | + 0.00993 | + 1.75203 | 3.8 | — 0.10616 | + 1.56136 |
| 0.5 | 0.01304   | 1.75282   | 3.9 | 0.13413   | 1.55552   |
| 0.6 | 0.01639   | 1.75342   | 4.0 | 0.16424   | 1.55130   |
| 0.7 | 0.01996   | 1.75382   | 4.1 | 0.19638   | 1.54897   |
| 0.8 | 0.02374   | 1.75396   | 4.2 | 0.23040   | 1.54883   |
| 0.9 | 0.02769   | 1.75382   | 4.3 | 0.26610   | 1.55119   |
| 1.0 | 0.03178   | 1.75336   | 4.4 | 0.30322   | 1.55633   |
| 1.1 | 0.03599   | 1.75254   | 4.5 | 0.34142   | 1.56459   |
| 1.2 | 0.04026   | 1.75133   | 4.6 | 0.38030   | 1.57628   |
| 1.3 | 0.04455   | 1.74970   | 4.7 | 0.41938   | 1.59170   |
| 1.4 | 0.04880   | 1.74760   | 4.8 | 0.45808   | 1.61119   |
| 1.5 | 0.05294   | 1.74500   | 4.9 | 0.49576   | 1.63505   |
| 1.6 | 0.05690   | 1.74188   | 5.0 | 0.53170   | 1.66358   |
| 1.7 | 0.06062   | 1.73821   | 5.1 | 0.56508   | 1.69706   |
| 1.8 | 0.06398   | 1.73396   | 5.2 | 0.59505   | 1.73572   |
| 1.9 | 0.06692   | 1.72911   | 5.3 | 0.62069   | 1.77977   |
| 2.0 | 0.06933   | 1.72365   | 5.4 | 0.64105   | 1.82932   |
| 2.1 | 0.07111   | 1.71757   | 5.5 | 0.65515   | 1.88441   |
| 2.2 | 0.07214   | 1.71087   | 5.6 | 0.66199   | 1.94496   |
| 2.3 | 0.07232   | 1.70356   | 5.7 | 0.66060   | 2.01076   |
| 2.4 | 0.07152   | 1.69566   | 5.8 | 0.65001   | 2.08148   |
| 2.5 | 0.06963   | 1.68718   | 5.9 | 0.62929   | 2.15660   |
| 2.6 | 0.06652   | 1.67818   | 6.0 | 0.59756   | 2.23545   |
| 2.7 | 0.06207   | 1.66869   | 6.1 | 0.55401   | 2.31719   |
| 2.8 | 0.05616   | 1.65878   | 6.2 | 0.49793   | 2.40084   |
| 2.9 | 0.04867   | 1.64852   | 6.3 | 0.42872   | 2.48522   |
| 3.0 | 0.03948   | 1.63801   | 6.4 | 0.34589   | 2.56904   |
| 3.1 | 0.02848   | 1.62736   | 6.5 | 0.24912   | 2.65086   |
| 3.2 | 0.01557   | 1.61668   | 6.6 | 0.13824   | 2.72914   |
| 3.3 | + 0.00066 | 1.60612   | 6.7 | — 0.01328 | 2.80224   |
| 3.4 | — 0.01634 | 1.59584   | 6.8 | + 0.12555 | 2.86845   |
| 3.5 | 0.03548   | 1.58602   | 6.9 | 0.27781   | 2.92604   |
| 3.6 | 0.05681   | 1.57685   | 7.0 | 0.44286   | 2.97327   |
| 3.7 | — 0.08037 | + 1.56855 | 7.1 | + 0.61981 | + 3.00842 |

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 7.2 | + 0.80758 | + 3.02980 | 8.4 | + 3.23917 | + 1.82088 |
| 7.3 | 1.00482   | 3.03586   | 8.5 | 3.38774   | 1.59276   |
| 7.4 | 1.21000   | 3.02513   | 8.6 | 3.51723   | 1.34939   |
| 7.5 | 1.42137   | 2.99630   | 8.7 | 3.62581   | 1.09284   |
| 7.6 | 1.63699   | 2.94827   | 8.8 | 3.71190   | 0.82542   |
| 7.7 | 1.85473   | 2.88014   | 8.9 | 3.77425   | 0.54964   |
| 7.8 | 2.07236   | 2.79123   | 9.0 | 3.81193   | + 0.26816 |
| 7.9 | 2.28749   | 2.68116   | 9.1 | 3.82436   | — 0.01623 |
| 8.0 | 2.49767   | 2.54984   | 9.2 | 3.81136   | 0.30069   |
| 8.1 | 2.70041   | 2.39747   | 9.3 | 3.77311   | 0.58238   |
| 8.2 | 2.89320   | 2.22456   | 9.4 | + 3.71014 | — 0.85853 |
| 8.3 | + 3.07357 | + 2.03198 |     |           |           |

## Bahn 24.

$$\eta_0 = + 1.748$$

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.0 | 0.00000   | + 1.74800 | 3.0 | + 0.04028 | + 1.63593 |
| 0.2 | + 0.00456 | 1.75043   | 3.2 | + 0.01583 | 1.61412   |
| 0.4 | 0.01015   | 1.75247   | 3.4 | — 0.01680 | 1.59281   |
| 0.6 | 0.01676   | 1.75390   | 3.6 | 0.05820   | 1.57338   |
| 0.8 | 0.02426   | 1.75444   | 3.8 | 0.10867   | 1.55753   |
| 1.0 | 0.03248   | 1.75382   | 4.0 | 0.16811   | 1.54723   |
| 1.2 | 0.04115   | 1.75175   | 4.2 | 0.23583   | 1.54468   |
| 1.4 | 0.04986   | 1.74793   | 4.4 | 0.31040   | 1.55231   |
| 1.6 | 0.05814   | 1.74209   | 4.6 | 0.38937   | 1.57264   |
| 1.8 | 0.06537   | 1.73399   | 4.8 | 0.46908   | 1.60825   |
| 2.0 | 0.07083   | 1.72345   | 5.0 | 0.54453   | 1.66173   |
| 2.2 | 0.07369   | 1.71040   | 5.2 | 0.60946   | 1.73542   |
| 2.4 | 0.07305   | 1.69485   | 5.4 | 0.65664   | 1.83108   |
| 2.6 | 0.06793   | 1.67698   | 5.6 | 0.67815   | 1.94935   |
| 2.8 | + 0.05734 | + 1.65715 | 5.8 | — 0.66598 | + 2.08901 |

| $t$  | $\xi$     | $\eta$    | $t$  | $\xi$     | $\eta$   |
|------|-----------|-----------|------|-----------|----------|
| 6.0  | —0.61243  | + 2.24655 | 10.2 | + 2.50474 | —2.73620 |
| 6.2  | 0.51068   | 2.41575   | 10.4 | 2.05188   | 2.99804  |
| 6.4  | 0.35540   | 2.58774   | 10.6 | 1.58215   | 3.17332  |
| 6.6  | —0.14337  | 2.75132   | 10.8 | 1.11373   | 3.26451  |
| 6.8  | + 0.12590 | 2.89349   | 11.0 | 0.66298   | 3.27782  |
| 7.0  | 0.44969   | 3.00026   | 11.2 | + 0.24376 | 3.22238  |
| 7.2  | 0.82172   | 3.05751   | 11.4 | —0.13297  | 3.10940  |
| 7.4  | 1.23204   | 3.05210   | 11.6 | 0.45932   | 2.95125  |
| 7.6  | 1.66722   | 2.97287   | 11.8 | 0.73035   | 2.76070  |
| 7.8  | 2.11076   | 2.81168   | 12.0 | 0.94377   | 2.55006  |
| 8.0  | 2.54386   | 2.56432   | 12.2 | 1.09944   | 2.33054  |
| 8.2  | 2.94644   | 2.23128   | 12.4 | 1.19876   | 2.11172  |
| 8.4  | 3.29844   | 1.81810   | 12.6 | 1.24397   | 1.90108  |
| 8.6  | 3.58121   | 1.33552   | 12.8 | 1.23733   | 1.70350  |
| 8.8  | 3.77902   | 0.79897   | 13.0 | 1.18043   | 1.52065  |
| 9.0  | 3.88037   | + 0.22775 | 13.2 | 1.07371   | 1.35019  |
| 9.2  | 3.87906   | —0.35634  | 13.4 | 0.917     | 1.184    |
| 9.4  | 3.77468   | 0.93063   | 13.6 | 0.709     | 1.006    |
| 9.6  | 3.57260   | 1.47328   | 13.8 | 0.454     | 0.789    |
| 9.8  | 3.28533   | 1.96487   | 14.0 | —0.16     | —0.49    |
| 10.0 | + 2.92154 | —2.38962  |      |           |          |

## Bahn 25.

$$\eta_0 = +1.750$$

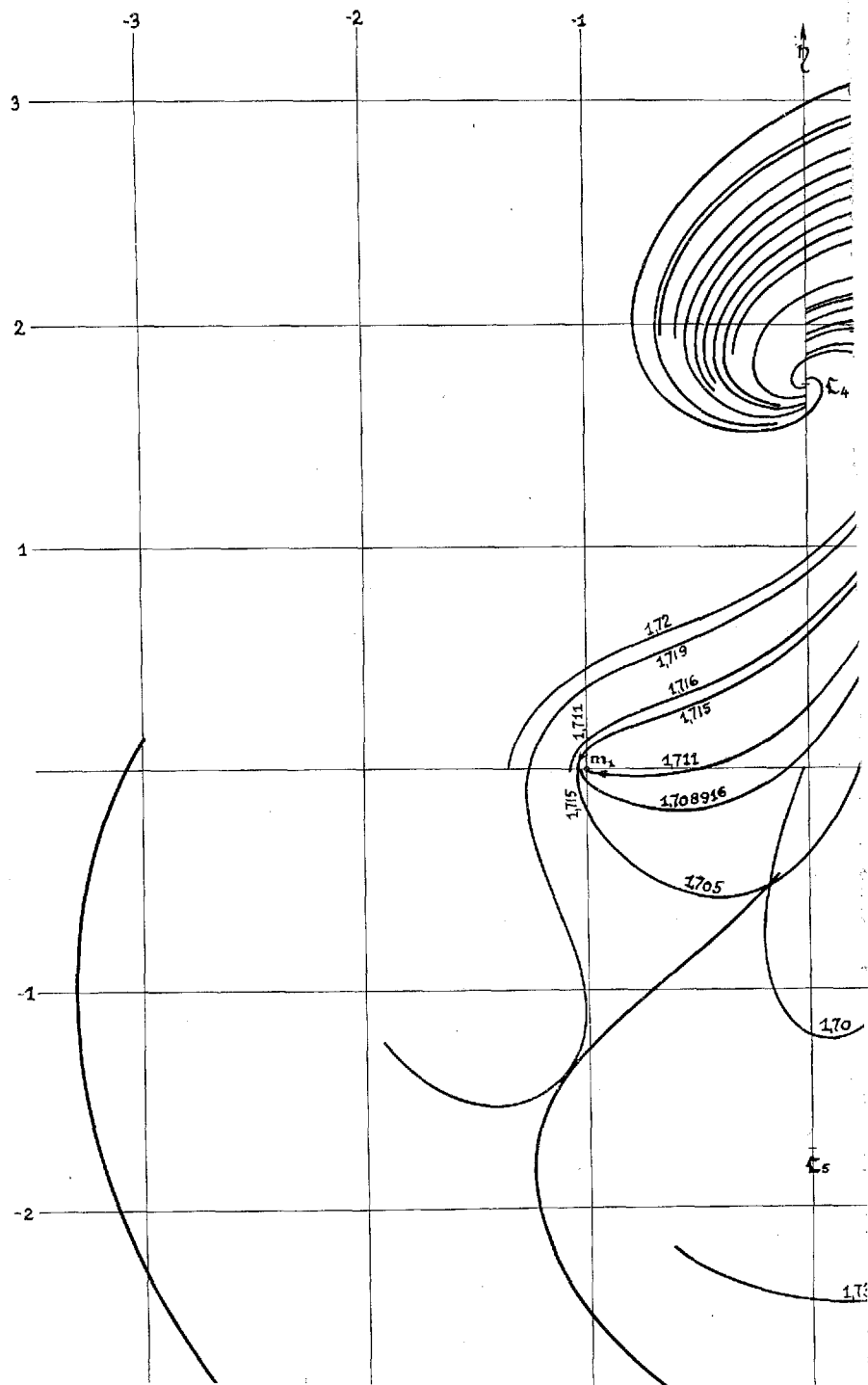
| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 0.0 | 0.00000   | + 1.75000 | 0.6 | + 0.01885 | + 1.75663 |
| 0.1 | + 0.00242 | 1.75141   | 0.7 | 0.02296   | 1.75708   |
| 0.2 | 0.00513   | 1.75273   | 0.8 | 0.02729   | 1.75724   |
| 0.3 | 0.00813   | 1.75395   | 0.9 | 0.03183   | 1.75708   |
| 0.4 | 0.01142   | 1.75503   | 1.0 | 0.03654   | 1.75655   |
| 0.5 | + 0.01500 | + 1.75594 | 1.1 | + 0.04138 | + 1.75561 |

| $t$ | $\xi$     | $\eta$    | $t$ | $\xi$     | $\eta$    |
|-----|-----------|-----------|-----|-----------|-----------|
| 1.2 | + 0.04629 | + 1.75422 | 4.6 | — 0.44217 | + 1.55056 |
| 1.3 | 0.05122   | 1.75234   | 4.7 | 0.48798   | 1.56792   |
| 1.4 | 0.05609   | 1.74992   | 4.8 | 0.53340   | 1.58993   |
| 1.5 | 0.06085   | 1.74694   | 4.9 | 0.57768   | 1.61695   |
| 1.6 | 0.06540   | 1.74335   | 5.0 | 0.61994   | 1.64936   |
| 1.7 | 0.06966   | 1.73912   | 5.1 | 0.65924   | 1.68750   |
| 1.8 | 0.07353   | 1.73423   | 5.2 | 0.69457   | 1.73169   |
| 1.9 | 0.07690   | 1.72865   | 5.3 | 0.72486   | 1.78218   |
| 2.0 | 0.07966   | 1.72237   | 5.4 | 0.74900   | 1.83912   |
| 2.1 | 0.08169   | 1.71538   | 5.5 | 0.76589   | 1.90258   |
| 2.2 | 0.08287   | 1.70768   | 5.6 | 0.77439   | 1.97246   |
| 2.3 | 0.08306   | 1.69927   | 5.7 | 0.77338   | 2.04852   |
| 2.4 | 0.08213   | 1.69018   | 5.8 | 0.76176   | 2.13035   |
| 2.5 | 0.07994   | 1.68043   | 5.9 | 0.73849   | 2.21733   |
| 2.6 | 0.07636   | 1.67006   | 6.0 | 0.70257   | 2.30865   |
| 2.7 | 0.07123   | 1.65914   | 6.1 | 0.65312   | 2.40329   |
| 2.8 | 0.06441   | 1.64773   | 6.2 | 0.58932   | 2.50005   |
| 2.9 | 0.05578   | 1.63591   | 6.3 | 0.51051   | 2.59757   |
| 3.0 | 0.04519   | 1.62380   | 6.4 | 0.41619   | 2.69428   |
| 3.1 | 0.03252   | 1.61152   | 6.5 | 0.30598   | 2.78852   |
| 3.2 | 0.01765   | 1.59920   | 6.6 | 0.17976   | 2.87848   |
| 3.3 | + 0.00046 | 1.58701   | 6.7 | — 0.03757 | 2.96224   |
| 3.4 | — 0.01913 | 1.57513   | 6.8 | + 0.12030 | 3.03785   |
| 3.5 | 0.04121   | 1.56377   | 6.9 | 0.29331   | 3.10332   |
| 3.6 | 0.06584   | 1.55315   | 7.0 | 0.48069   | 3.15662   |
| 3.7 | 0.09306   | 1.54351   | 7.1 | 0.68142   | 3.19582   |
| 3.8 | 0.12288   | 1.53513   | 7.2 | 0.89419   | 3.21900   |
| 3.9 | 0.15528   | 1.52829   | 7.3 | 1.11747   | 3.22439   |
| 4.0 | 0.19019   | 1.52330   | 7.4 | 1.34948   | 3.21037   |
| 4.1 | 0.22751   | 1.52046   | 7.5 | 1.58822   | 3.17548   |
| 4.2 | 0.26708   | 1.52012   | 7.6 | 1.83147   | 3.11846   |
| 4.3 | 0.30867   | 1.52260   | 7.7 | 2.07683   | 3.03833   |
| 4.4 | 0.35199   | 1.52826   | 7.8 | 2.32176   | 2.93436   |
| 4.5 | — 0.39665 | + 1.53746 | 7.9 | + 2.56358 | + 2.80612 |

| $t$  | $\xi$     | $\eta$    | $t$  | $\xi$     | $\eta$    |
|------|-----------|-----------|------|-----------|-----------|
| 8.0  | + 2.79954 | + 2.65350 | 10.7 | + 1.01611 | — 4.15771 |
| 8.1  | 3.02684   | 2.47675   | 10.8 | 0.68946   | 4.20497   |
| 8.2  | 3.24268   | 2.27643   | 10.9 | 0.36244   | 4.22480   |
| 8.3  | 3.44132   | 2.05346   | 11.0 | + 0.03751 | 4.21752   |
| 8.4  | 3.62911   | 1.80909   | 11.1 | — 0.28294 | 4.18369   |
| 8.5  | 3.79455   | 1.54492   | 11.2 | 0.59662   | 4.12402   |
| 8.6  | 3.93834   | 1.26284   | 11.3 | 0.90130   | 4.03948   |
| 8.7  | 4.05838   | 0.96503   | 11.4 | 1.19489   | 3.93118   |
| 8.8  | 4.15285   | 0.65393   | 11.5 | 1.47538   | 3.80042   |
| 8.9  | 4.22025   | 0.33219   | 11.6 | 1.74094   | 3.64868   |
| 9.0  | 4.25940   | + 0.00260 | 11.7 | 1.98985   | 3.47756   |
| 9.1  | 4.26946   | — 0.33190 | 11.8 | 2.22055   | 3.28884   |
| 9.2  | 4.24995   | 0.66832   | 11.9 | 2.43164   | 3.08440   |
| 9.3  | 4.20072   | 1.00364   | 12.0 | 2.62187   | 2.86624   |
| 9.4  | 4.12197   | 1.33485   | 12.1 | 2.79019   | 2.63650   |
| 9.5  | 4.01427   | 1.65903   | 12.2 | 2.93571   | 2.39738   |
| 9.6  | 3.87846   | 1.97333   | 12.3 | 3.05774   | 2.15121   |
| 9.7  | 3.71572   | 2.27509   | 12.4 | 3.15579   | 1.90039   |
| 9.8  | 3.52747   | 2.56179   | 12.5 | 3.22957   | 1.64739   |
| 9.9  | 3.31538   | 2.83110   | 12.6 | 3.27902   | 1.39475   |
| 10.0 | 3.08132   | 3.08093   | 12.7 | 3.30431   | 1.14507   |
| 10.1 | 2.82736   | 3.30939   | 12.8 | 3.30583   | 0.90098   |
| 10.2 | 2.55571   | 3.51487   | 12.9 | 3.28425   | 0.66512   |
| 10.3 | 2.26868   | 3.69596   | 13.0 | 3.24047   | 0.44018   |
| 10.4 | 1.96871   | 3.85155   | 13.1 | 3.17568   | 0.22884   |
| 10.5 | 1.65827   | 3.98075   | 13.2 | 3.09134   | — 0.03375 |
| 10.6 | + 1.33989 | — 4.08293 | 13.3 | — 2.98919 | + 0.14246 |



## Bahnen im Probleme Restre





nt, die zu  $L_4$  asymptotisch sind.

