

Aritmetiske Opgaver

ved

Halvaarsprøven 1885.

John V. Finsen.

$$\begin{aligned}
 & 1) (3a-2b)(4-b) - (b-2)(a-3b) \\
 & = 12a - 8b - 3ab + 2bb - (ab - 2a - 3bb + 6b) \\
 & = 12a - 8b - 3ab + 2bb - ab + 2a + 3bb - 6b \\
 & = 14a - 14b - 4ab + 5bb
 \end{aligned}$$

2) Hvilke Brøker med Nævneren n ligger imellem a og $(a+1)^2$?

$$a = \frac{an}{n} \quad (a+1) = \frac{an}{n} + \frac{n}{n} = \frac{an+n}{n}$$

$$\frac{an}{n}, \frac{an+1}{n}, \frac{an+2}{n}, \frac{an+3}{n}, \dots, \frac{an+(n-1)}{n}, \frac{an+n}{n}$$

3) $6ap - 2an - 12p + 4n$ opløses i Faktorer.

$$= 6p(a-2) - 2n(a-2)$$

$$= (a-2)(6p-2n)$$

$$\begin{aligned}
 4) \quad & \frac{a}{12p} + \frac{b-3}{4} - \frac{3-b}{3p} + 4p \text{ trækkes sammen til en Brøk.} \\
 & = \frac{a}{12p} + \frac{3bp-6p}{12p} - \frac{12-4b}{12p} + \frac{48p^2}{12p} \\
 & = \frac{a+3bp-6p-12+4b+48p^2}{12p}
 \end{aligned}$$

$$\begin{aligned}
 5) \quad & -(-a-(2-a-(3-2a)+b)-b-5) \\
 & = -(-a-(2-a-3+2a+b)-b-5) \\
 & = -(-a-2+a+3-2a-b-b-5) \\
 & = a+2-a-3+2a+b+b+5 \\
 & = 4+2a+2b
 \end{aligned}$$

$$\begin{aligned}
 6) \quad & \frac{43}{82} Kr - 2 \frac{7}{41} Jne - \frac{215}{216} Eb \\
 & \quad \frac{89}{41} Jne \quad \frac{3375}{59} Kr \\
 & \frac{89}{41} \cdot \frac{125}{54} \cdot \frac{82}{43} = \frac{89 \cdot 125}{27} = \frac{11125}{27} = 412 \frac{1}{27} \\
 & = 4 Kr 12 \frac{1}{27} Jne
 \end{aligned}$$

I. Klasse

Opgaver. Aritmetiske.

Halvaarsexamen 1835.

Thorkild Sv. Vilandt.

Afl. 14. 5. 5.

$$\begin{aligned}
 & 1) (3a-2b)(4-b) - (b-2)(a-3b) \\
 & = (-3ab + 2bb + 12a - 2b) - (-3bb + 6b + ab - 2a) \\
 & = -3ab + 2bb + 12a - 2b - (-3bb + 6b + ab - 2a) \\
 & = -2ab - bb + 10a - 2b
 \end{aligned}$$

2) Welke Brøker med n til Nævner
ligge mellem a og $a+1$?

$$a \frac{a+k}{n} + \frac{a+k}{n} + \frac{a+k}{n} \dots (a+1)$$

$$\begin{aligned}
 & 3) 6ap - 2an - 12p + 4n \\
 & = 6p(a-2) - 2n(a-2) \\
 & = (6p-2n)(a-2)
 \end{aligned}$$

$$\begin{aligned}
 & 4) \frac{a}{12p} + \frac{b-2}{4} - \frac{3-b}{3p} + \frac{4}{p} \text{ trækkes sammen til} \\
 & = \frac{a}{12p} + \frac{3bp-6p}{12p} - \frac{12-4b}{12p} + \frac{40p}{12p} \text{ een Brøk?} \\
 & = \frac{a+3bp-6p-12-4b+40p}{12p} \\
 & = \frac{a+3bp-40p-12-4b}{12p}
 \end{aligned}$$

$$\begin{aligned}
 & 5) -(-a-(2-a-(3-2a)+b)-b-5) \\
 & = -(-a-(2-a-3+2a+b)-b-5) \\
 & = -(-a-2+a+3-2a-b-b-5) \\
 & = +a+2-a-3+2a+b+b+5 \\
 & = +2a+4+2b
 \end{aligned}$$

$$b) \frac{43}{82} \text{ Kw} - 2 \frac{41}{41} \text{ Gre} - \frac{215}{216} \text{ Ab}$$

$$\frac{43}{82} - \frac{89}{41} - \frac{215}{216}$$

$$\frac{89 \cdot 89 \cdot 2160}{93 \cdot 41 \cdot 21500}$$

$$(2 \frac{234}{9245} \text{ Gre}) (4 \frac{7777}{9612} \text{ Gre})$$

$$48 \frac{437}{4806} \text{ Gre.}$$

Mathematiske Opgaver

ved

Halvaarsexamen 1885. -

for

Niels Smith Dahl.

Afs. 14. 5, 6

N^o 1.

$$\begin{aligned}
 & (3a - 2b) \cdot (4 - b) - (b - 2) \cdot (a - 3b) = \\
 & (12a - 8b - 3ab + 2bb) - (ab - 3bb - 2a + 6b) = \\
 & \underline{12} - \underline{8b} - \underline{3ab} + \underline{2bb} - \underline{ab} + \underline{3bb} + \underline{2a} - \underline{6b} = \\
 & \underline{14a - 14b - 4ab + 5bb} \quad \checkmark
 \end{aligned}$$

N^o 2

Hvilke Brøker med N til Nævner
ligge imellem a og $(a+1)$? =

$$\left(\frac{a+n}{n} + \frac{a+1-1}{n} + \frac{a+2-2}{n} + \frac{a+3-3}{n} \dots (a+n) \right)$$

N^o 3 $6ap - 2ar - 12p + 4n$ optösesi Faktörleri.

$$= -6p(a-2) - 2n(a-2) =$$

$$\underline{(a-2)(6p-2n)}$$

✓

N^o 5 $-(-a - (2 - a - (3 - 2a) + b) - b - 5) =$

$$-(-a - (2 - a - 3 + 2a + b) - b - 5) =$$

$$-(-a - 2 + a + 3 - 2a - b - b - 5) =$$

$$\underline{a + 2 - a - 3 + 2a + b + b + 5} =$$

$$\underline{2a - 4 + 2b}$$

N^o 4 $\frac{a}{12p} + \frac{b-2}{4} - \frac{3-b}{3p} + p$ ortak paydası ile birleştir?

$$\frac{a}{12p} + \frac{bp-2p}{4p} - \frac{3-b}{3p} + \frac{pp}{p} =$$

$$\frac{a}{12p} + \frac{3bp-6p}{12p} - \frac{12-\cancel{4}b}{12p} + \frac{12pp}{12p} =$$

$$\frac{a + 3bp - 6p - 12 - 4b + 12pp}{12p} =$$

$$\underline{\underline{\frac{a + 3bp - 6p - 12 - 4b + 12pp}{12p}}}$$

N^o 6

$$\frac{43}{82} K - 2 \frac{7}{41} p - \frac{215}{216} M =$$

$$\frac{43}{82} - \frac{89}{41} - 99 \frac{29}{54} =$$

$$\frac{89}{41} \cdot 99 \frac{29}{54} \cdot \frac{82}{43} =$$

$$\frac{89}{41} \cdot \frac{4375}{54} \cdot \frac{82}{43} =$$

$$\frac{27}{389305} =$$

$$\underline{\underline{3 \frac{1161}{1161} K - 35 \frac{370}{1161} p}}$$

Regneopgaver

ved

Halvaarsprøven

for
Vilhelm Gjern.

A. H. K. 5, 45

$$(a-2b)(4-b) - (b-2)(a-3b) = \quad (1)$$

$$(2a-8b-3ab-2bb) - (ab-2a-3bb)$$

$$(2a-8b-3ab-2bb-ab+2a-3bb-bb)$$

$$14a-11b+4ab-bb$$

$$6ap-2an-12p+4n \text{ lösere Faktor (3)}$$

$$\begin{array}{r} 2 \overline{) 6ap-2an-12p+4n} \\ 2 \overline{) 3ap-an-6p+2n} \\ 3 \overline{) 3ap-an-3p+n} \\ \hline ap-an-p-n \end{array}$$

$$12+ap-an-p-n$$

$$\frac{a}{12p} + \frac{b-2}{4p} - \frac{3-b}{3p} + 4p \text{ brück zusammenfassen Brück (4)}$$

$$\frac{a}{2p} \left[\frac{2-2a}{2p} \right] \quad \frac{b-4ap}{4p} \quad \frac{b-3ap}{4p} \quad \frac{3-3bp+12p}{12p}$$

$$\frac{b-2}{4} \left[\frac{p-bp-2p}{4} \right] \quad \frac{3-b}{3p} \quad \frac{4p}{3p} \quad \frac{6-12p+12p}{12p}$$

$$\frac{b-4ap}{4p} \quad \frac{3-b}{3p} \quad \frac{4p}{3p} \quad \frac{6-12p+12p}{12p}$$

$$\frac{15bp+3ab}{2} - \frac{19bp+3ab}{2}$$

$$\begin{aligned}
 5) \quad & -(-a-(2-a-(3-2a)+b)-b-5) = \\
 & -(a-(2-a-3+2a+b)-b-5) = \\
 & -(a-2+a+3-2a-b-b-5) = \\
 & +a+2-a-3+2a+b+b+5 = \\
 & 2a-4
 \end{aligned}$$

$$\begin{aligned}
 6) \quad & \frac{43}{82} K_r - 2\frac{7}{41} \emptyset - \frac{215}{216} A \\
 & \frac{2\frac{7}{41} \cdot \frac{215}{216}}{\frac{43}{82}} = 1\frac{11}{29}
 \end{aligned}$$

2) Hvilke Brøker med Nævneren n
 ligger mellem a og $(a+1)$

$$a\frac{1}{n}, a\frac{2}{n}, a\frac{3}{n}$$

Opgaver for

Henrik C. Nielsen 1885.

$$1) (3a-2b)(4-b)-(b-2)(a-3b)$$

$$= 12a - 8b - 3ab + 2bb - ab - 2a - 3bb + 6b$$

$$= 10a - 1bb - 2ab - 2b$$

$$2) -(-a-(2-a-(3-2a)+b)-b-3)$$

$$= -(-a-(2-a-3+2a+b)-b-3)$$

$$= -(-a-2+a+3-2a-b-b-3)$$

$$= -a+2-a-3+2a+b+b+3$$

$$= 2a - aa + 2 + bb$$

$$3) \frac{43}{82} Kv - 2 \frac{7}{41} Pre - \frac{215}{216} H$$

$$= \frac{43}{82} Kv - 2 \frac{7}{41} Pre - \frac{21500}{21600}$$

$$\left(\frac{82 \cdot 21500}{41 \cdot 21600} \right) : \frac{43}{82} = \frac{89 \cdot 21500 \cdot 82}{41 \cdot 21600 \cdot 43}$$

$$= \frac{89 \cdot 5}{108} = \frac{445}{108}$$

$$\left(4 \frac{13}{108} Kv \right) \quad 4 \frac{13}{108} Kv$$

$$4 \frac{13}{108} Kv$$

7) $\frac{a}{12p} + \frac{b-2}{4} - \frac{3-b}{3p} + 4p$ trekkes sammen til
 en Brøk
 (=)

$$= \frac{a + 3p(b-2) - 4(3-b) + 12p^2}{12p} \quad \checkmark$$

Opgaver

ved

Halvaarsprøven

for

Kabens Hansen.

1885.

$$\begin{aligned}
 & 4) (3a-2b)(4-b) - (b-2)(a-3b) \\
 &= (12a-8b-3ab+2bb) - (ab-2a-3bb+6b) \\
 &= 12a-8b-3ab+2bb-ab+2a+3bb-6b \\
 &= 14a - 4ab - 14b - 5bb \quad \checkmark \\
 & \quad \quad \quad + \text{et.}
 \end{aligned}$$

$$\begin{aligned}
 & 5) 6ap - 2an - 12p + 4n \text{ opløses i 'Faktorer'.} \\
 &= 2 \cdot 3a \cdot p - 2 \cdot a \cdot n - 2 \cdot 2 \cdot 3 \cdot p + 2 \cdot 2 \cdot n
 \end{aligned}$$

$$4) \frac{a}{12p} + \frac{b-2}{4} - \frac{3-b}{3p} + 4p \text{ trækkes sammen til en Brøk}$$

$$\begin{aligned}
 & 6) -(a-(2-a-(3-2a)+b)b-5) \\
 &= -(-a-(2-a-3+2a+b)-b-5) \\
 &= -(-a-2+a+3-2a-b-b+5) \\
 &= +a+2-a-3+2a+b+b+5 \\
 &= +2a + 2b \quad \checkmark
 \end{aligned}$$

$$\begin{array}{r}
 \frac{a}{12p} \quad \frac{12p}{a} \\
 + \frac{b-2}{4} \quad 3bp-6p \\
 - \frac{3-b}{3p} \quad 12-4b \\
 \hline
 4p \quad \frac{12-6p+3bp-4b}{12p}
 \end{array}$$

$$6) \quad \frac{43}{82} \text{ hr} - 2 \frac{7}{41} \text{ fr} - \frac{215}{216} \text{ to}$$

$$\frac{43}{82}$$

$$\frac{315}{316} \cdot \frac{89}{41}$$

$$\frac{43}{82}$$

$$\frac{89}{41} \text{ fr}$$

$$\frac{557108}{2298870} \text{ fr}$$

$$\frac{315}{316}$$

$$\frac{28035}{82}$$

$$\frac{56670}{229280}$$

$$\frac{2298870}{2298870}$$

$$\frac{12956}{43}$$

$$\frac{38868}{51824}$$

$$\frac{557108}{315}$$

$$\frac{89}{316}$$

$$\frac{2835}{2520}$$

$$\frac{12956}{28035}$$

$$\frac{12956}{12956}$$

$$4) \frac{12n}{a} + \frac{b-2}{4} - \frac{3-b}{3n} + 4n \text{ oploies } a'$$

$$= \frac{a}{12n} + \frac{3bn - 6n}{12n} - \frac{12 - 4b}{12n} + \frac{48n}{12n}$$

$$= \frac{a + 3bn - 6n - 12 + 4b + 48n}{12n}$$

$$= \frac{a + 3bn + 42n - 12 + 4b}{12n}$$

Opgavebog
for
L. Knudsen.

$$\begin{aligned}
 & (3a-2b) \cdot (4-b) - (b-2) \cdot (a-3b) \\
 &= (12a - 8b - 3ab - 2bb) - (ba - 2a - 3bb + 6b) \\
 &= 12a - 8b - 3ab - 2bb - ba + 2a + 3bb - 6b \\
 &= 14a - 14b - 3ab - 2bb - ba + 2a - 6b \\
 & \quad 2.
 \end{aligned}$$

$$\begin{aligned}
 & -(a - (2 - a - (3 - 2a) + b) - b - 5) \\
 &= -(-a - (2 - a - 3 + 2a + b) - b - 5) \\
 &= -(-a - 2 + a + 3 - 2a - b - b - 5) \\
 &= +a + 2 - a - 3 + 2a + b + b - 5 \\
 &= \cancel{a} + 4 + 2a - 2b
 \end{aligned}$$

$$\begin{aligned}
 & \frac{43}{82} \text{ Kr} - 2 \frac{7}{41} \text{ Pr} - \frac{215}{216} \text{ La} \\
 &= \frac{43}{82} \text{ Kr} - 2 \frac{7}{41} \text{ Pr} - \frac{215}{21600} \text{ La} \\
 &= \frac{2 \frac{7}{41} \cdot \frac{215}{21600}}{\frac{43}{82}} = 2 \frac{7}{41} \cdot \frac{215}{21600} = \frac{89}{41} \cdot \frac{215}{21600} \\
 & \quad \frac{43}{82} \\
 & \quad 19135 \\
 & \quad \hline
 & \quad 885600
 \end{aligned}$$

$$\frac{19135}{885600} \cdot \frac{43}{82} = \frac{19135}{885600} \cdot \frac{82}{43} = \frac{1568970}{38080800}$$

Mathematike Opgaver

ved

Halvaarsexamenen 1885

for

Christian Quedens

$$1/ (3a \div 2b)(4 \div b) \div (b \div 2)(a \div 3b)$$

$$(12a - 8b - 3ab + 2bb) \div (ab - 2a - 3bb + 6b)$$

$$(12a - 8b - 3ab + 2bb) \div ab + 2a + 3bb - 6b$$

$$(12a - 8b - 3ab + 2bb) \div ab + 2a + 3bb - 6b$$

$$14a - 14b - 4ab + 5bb \quad \checkmark$$

2/ Hvilke Brøker med tælleren n ligger imellem a og $(a+1)$

$$\frac{a}{n} \cdot \frac{a+1}{n} - \frac{a+2}{n} \cdot \frac{a+3}{n} \dots \dots \frac{a-2}{n} \cdot \frac{a-1}{n} \cdot \frac{a+1}{n}$$

3/ $6ap - 2an - 12p + 4n$ Opløs i Faktorer

$$6p(a-2) - 2n(a-2)$$

$$(6p-2n)(a-2) \quad \checkmark$$

$$4/ \frac{a}{12p} + \frac{b-2}{4} - \frac{3-b}{3p} + 4p$$

$$\frac{a + 3bp - 6p}{12p} \div \frac{12p - 4bp + 48p}{12p}$$

$$\frac{a + 3bp - 6p + 48p}{12p} \div \frac{12p - 4bp}{12p}$$

$$\frac{a + 3bp - 6p + 48p}{12p} \div (12p - 4bp)$$

$$\frac{a+36p-6p+48p \div (12p-46p)}{12p}$$

$$\frac{a+36p-6p+48p \div 12p+46p}{12p}$$

$$\frac{a+76p+30p}{12p}$$

$$\begin{aligned} &5/-(a-12-a-(3-2a)+b)-b-5) \\ &-(a-12-a-3+2a+b)-b-5) \\ &-(a-2+a+3-2a-b-b-5) \\ &a+2-a-3+2a+b+b+5 \end{aligned}$$

$$2a-4+2b$$

$$6/ \frac{43}{82} Kv - 2 \frac{7}{41} \phi - \frac{215}{216} H$$

$$\frac{43}{82} Kv - \frac{89}{41} \phi - \frac{215}{216} H$$

$$\frac{43}{82} Kv - \frac{89}{41} \phi - \frac{21500}{216} Kv$$

$$\frac{21500 \cdot 89 \cdot 43}{216 \cdot 41 \cdot 82} = \frac{21500 \cdot 89 \cdot 82}{216 \cdot 41 \cdot 43} = \frac{21500 \cdot 89 \cdot 41}{18 \cdot 41 \cdot 43} = \frac{21500 \cdot 89}{18 \cdot 43} = \frac{10250 \cdot 89}{9 \cdot 43}$$

$$\frac{956750}{587} = (24 Kv(43)) 24 Kv 43 \frac{300}{587}$$

I Klasse

Arithmetiske Opgaver

ved

Kolvaarsprøven 1885

for

Theodor Andersen

1)

$$(3a-2b)(4-b)-(b-2)(a-3b)$$

$$= 12a - 8b - 3ab + 2bb - (b-2)(a-3b)$$

$$= 12a - 8b - 3ab + 2bb - (ab - 2a - 3bb + 6b)$$

$$= 12a - 8b - 3ab + 2bb - ab + 2a + 3bb - 6b$$

$$= 14a - 14b - 4ab + 5bb \quad \checkmark$$

2)

$$6ap - 2an - 12p + 4n \text{ oplosen Factoren}$$

$$= 6p(a-2) - 2n(a-2)$$

$$= (a-2)(6p-2n) \quad \checkmark$$

3)

$$-(-a-(2-a-(3-2a)+b)-b-5)$$

$$= -(-a-(2-a-3+2a+b)-b-5)$$

$$= -(-a-2+a+3-2a-b)-b-5)$$

$$= +a-2+a-3+2a+b+b+5$$

$$= 2a+4+2b \quad \checkmark$$

2)

$$\frac{43}{82} \text{ Kr} - 2 \frac{2}{11} \text{ f} - \frac{212}{216} \text{ Rand}$$

$$= \frac{43}{82} \text{ Kr} - 2 \frac{2}{11} - 99 \frac{116}{216} \text{ Kr}$$

$$\frac{43}{82} : \frac{11}{11} = 1 \frac{765}{20172}$$

$$1 \frac{765}{20172} \cdot 99 \frac{116}{216} = 99 \frac{2465}{20172}$$

$$\text{Facit } 99 \frac{2465}{20172} \text{ f}$$

3)

$$\frac{a}{12p} + \frac{b-2}{9} - \frac{2-b}{3p} + \frac{4p}{9}$$

$$= \frac{a}{12p} + \frac{3bp-6p}{12p} - \frac{12-4b}{12p} + \frac{48p}{12p}$$

$$= \frac{a+3bp-6p-12+4b+48p}{12p}$$

$$= \frac{a+3bp+42p-12+4b}{12p}$$

4) Hvilke Brøker med Nævneren n
ligge imellem a og (a+1).

$$\frac{(an+1)}{n} + \frac{(an+2)}{n} + \frac{(an+3)}{n} - \dots - \frac{(an+n-1)}{n}$$

Th. Andersen

Opgaver

ved

Kalvaarseksamen

— for —

J. Knutsen.

$$\begin{aligned}
 1) & (3a-2b)(4-b)-(b-2)(a-3b) \\
 &= (12a-8b-3ab+2bb)-(ab-2a-3bb+6b) \\
 &= 12a-8b-3ab+2bb-ab+2a+3bb-6b \quad \checkmark \\
 &= 14a-14b+3aabb+5bb \quad \checkmark
 \end{aligned}$$

2) Hvilke Brøker med n til Nævner
ligge imellem a og $(a+1)^n$ $\checkmark$

3) $6ap-2ar-12p+7n$ gøres i Primfaktorer $\checkmark$

$$6ap = 2 \cdot 3 \cdot a \cdot p$$

$$-2ar = -2 \cdot a \cdot r$$

$$-12p = -2 \cdot 2 \cdot 3 \cdot p$$

$$7n = 7 \cdot n$$

4) $\frac{a}{12p} + \frac{b-2}{4} - \frac{3-b}{3p} + 4p$ trækkes sammen til
en Brøk. $\checkmark$

$$\begin{aligned}
 5) & -(a-(2-a-(3-2a)+b)-b-5) \\
 &= -(a-(2-a-3+2a+b)-b-5) \\
 &= -(a-2+a+3-2a-b-b-5)
 \end{aligned}$$

$$= +a + 2a - 3 + 2a + b + b + 5 \quad \checkmark$$

$$= 4 + \overset{2a}{\cancel{bb}} + 2a.$$

$$c) \frac{43}{82} kv - 2 \frac{7}{41} q - \frac{215}{216} \overset{0v}{\cancel{ab}} \\ \frac{89}{41} q \quad \frac{21500}{216} kv$$

$$\frac{5425.89}{21.43} \checkmark$$

$$\frac{466123}{1161} \checkmark = 401 \frac{564}{1161} q = 421 \frac{182}{387} q$$

J. Kruken.

1^{ste} Klasse

Opgaver

ved

Halvaarsprøve 1885.

af

Peter Schousboe.

No 1

$$\begin{aligned}
 & (3-2b)(4-b) - (b-2)(a-3b) \\
 & = (12a - 8b - 3ab + 2bb) - (ab - 2a - 3bb + 6b) \\
 & = 12a + 8b + 3ab - 2bb - ab + 2a + 3bb - 6b \\
 & = 14a + 2b + 3ab + 1bb - ab
 \end{aligned}$$

No 3

$$\begin{aligned}
 & 6ap - 2am - 12p + 4m \text{ opløses i faktorer} \\
 & = 2 \cdot 2 \cdot 2ap - 2am - 2 \cdot 2 \cdot 3p + 2 \cdot 2m
 \end{aligned}$$

Kummer 5

$$\begin{aligned}
 & -(a - (2a - (3 - 2a) + b) - b - 5) \\
 & = -(a - (2 - a - 3 + 2a + b) - b - 5) \\
 & = -(a - 2 + a + 3 - 2a - b - b - 5) \\
 & = +a + 2 - a - 3 + 2a + b + b + 5 \\
 & = 4 + 2a + 2b
 \end{aligned}$$

Peter Schouboe

Aritmetiske Opgaver

ved Halvaarsprøven 1885.

Edward Bryndum.

$$\begin{aligned}
 1) & (3a-2b)(4-b)-(b-2)(a-3b) \\
 & = 12a - 8b - 3ab + 2bb - ab + \underline{2a} + 3bb - 6b \\
 & = 10a - 2b - 3ab - bb - ab
 \end{aligned}$$

2) Hvilke Brøker med Nævneren n ligger imellem:

a og $(a+1)$?

$$\frac{1}{n} + \frac{2}{n} + \frac{3n}{n} + \frac{4}{n} + \dots + \frac{n}{n}$$

3) $6ap - 2an - 12p + 4n$ opløses i Factorer.

$$= 6p(a-2) - 2n(a-2)$$

$$= (a-2)(6p-2n) \quad \checkmark$$

$$4) \frac{a}{12p} + \frac{b-2}{4} - \frac{3-b}{3p} + 14p \quad \text{Trakkes sammen til en Brøk.}$$

$$= \frac{a}{12p} + \frac{3b-6}{12p} - \frac{12-4b}{12p} + 14p$$

$$= \frac{a+3b-6-12+4b}{12p} + 14p$$

$$= \frac{a-6+7b}{12p} + 14p$$

$$5) -(-a-(2-a-(3-2a)+b)-b-5)$$

$$= -(-a-(2-a-3+2a+b)-b-5)$$

$$= -(-a-2+a+3-2a-b-b-5)$$

$$= a+2-a-3+2a+b+b+5$$

$$= 2a+4+2b$$

$$6) \frac{143}{82} \text{ Hv} - 2\frac{7}{41} \text{ Gre} - \frac{215}{216} \text{ Hv}$$

$$\frac{143}{82} \text{ Hv} - \frac{89}{41} \text{ Gre} - \frac{2150}{216} \text{ Hv} \quad 2150$$

$$\frac{89 \cdot 2150 \cdot 82}{41 \cdot 216 \cdot 43} = \frac{89 \cdot 50 \cdot 41}{41 \cdot 108} = \frac{89 \cdot 50}{108}$$

$$\begin{array}{r} 89 \\ 50 \\ \hline 00 \\ 445 \\ \hline 4450 \end{array}$$

$$\begin{array}{r} 108) 4450 \overline{) 41} \\ 432 \\ \hline 130 \\ 108 \\ \hline 22 \end{array}$$

$$41\frac{11}{34} \text{ Gre}$$

I classe.

Arithmetiske
Opgaver

. ved

Kalvaarsprøve 1885.

Harry Michelsen.

$$\begin{aligned}
 & 1) \\
 & (3a - 2b)(4 - b) - (b - 2)(a - 3b) \\
 & = 12a - 8b - 3ab + 2bb - (ab - 2a - 3bb + 6b) \\
 & = 12a - 8b - 3ab + 2bb - ab + 2a + 3bb - 6b \\
 & = 14a - 14b - 4ab + 5bb. \quad \checkmark
 \end{aligned}$$

$$\begin{aligned}
 & 2) \\
 & 6ap - 2an - 12p + 4n \text{ oplosen i Faktoren} \\
 & 6p(a - 2) - 2n(a - 2) \\
 & (6p - 2n)(a - 2) \quad \checkmark
 \end{aligned}$$

$$\begin{aligned}
 & 3) \\
 & -(-a - (2 - a - (3 - 2a) + b) - b - 5) \\
 & = -(-a - (2 - a - 3 + 2a + b) - b - 5) \\
 & = -(-a - 2 - a + 3 - 2a - b - b - 5) \\
 & = a + 2 - a - 3 + 2a + b + b + 5 \\
 & = 2a + 4 + 2b. \quad \checkmark
 \end{aligned}$$

4)

$$\frac{43}{82} \text{ Kr.} - 2 \frac{7}{41} \text{ Ø} - \frac{215}{216} \text{ ø}$$

$$\frac{43}{82} \text{ Kr.} \quad \frac{89}{41} \text{ Ø} \quad \frac{21500}{21600} \text{ Kr.}$$

$$\frac{89 \cdot 21500 \cdot (4) \cdot 82^2}{41 \cdot 21600 \cdot 43} - \frac{890}{216}$$

Facit $4 \frac{13}{108} \text{ Øre.}$

5)

Hvilke Brøker med (n) Nævneren n ligge
imellem a og $(a+1)$

$$\frac{1}{n} + \frac{2}{n} + \frac{3}{n} \dots \frac{a}{n}$$

6)

$$\frac{a}{12p} + \frac{b-2}{4} - \frac{3-b}{3p} + 4p.$$

$$\frac{ap}{12} + \frac{3b-6}{12} - \frac{12p-4b}{12} + \frac{3p}{12}$$

$$\frac{ap + 3b - 6 - 12p + 4b + 3p}{12}$$

$$= ap - b - 6 - 9p.$$

1. Klasse.

Opgaver

ved

Halvaarsprøven 1885

af

Erik Bastian.

$$\begin{aligned}
 1) & (3a-2b)(4-b) - (b-2)(a-3b) \\
 &= (12a-8b-3ab+2bb) - (ab-2a-3bb+6b) \\
 &= 12a-8b-3ab+2bb-ab+2a+3bb-6b \\
 &= 14a - \overset{14}{2}b - 4ab + 5bb.
 \end{aligned}$$

$$\begin{aligned}
 2) & 6ap-2an-12p+4n \\
 &= 6p(a-2)-2n(a-2) \\
 &= (a-2)(6p-2n) \quad \checkmark
 \end{aligned}$$

$$\begin{aligned}
 3) & -(-a-(2-a-(3-2a)+b)-b-5) \\
 &= -(-a-(2-a-3+2a+b)-b-5) \\
 &= -(-a-2+a+3-2a-b-b-5) \\
 &= a+2-a-3+2a+b+b+5 \\
 &= 4+2a+bb. \quad \checkmark
 \end{aligned}$$

$$\begin{aligned}
 4) & \frac{43}{82} \text{ Kr.} - 2 \frac{7}{41} \text{ Gr.} - \frac{213}{216} \text{ Pf.} \\
 & \frac{43}{82} \text{ Kr.} = \frac{89}{41} \text{ Gr.} - \frac{21300}{216} \text{ Kr.} \\
 & \frac{89}{41} \cdot \frac{21300}{216} \cdot 82 = 403 \frac{417}{1186}
 \end{aligned}$$

Hvilke Brøker med Nævneren n
ligge imellem a og $(a+1)$

$$= \frac{an}{n}, \frac{an+1}{n}, \frac{an+2}{n}, \dots, \frac{an+n-1}{n}, \frac{an+n}{n} \quad \checkmark$$

$$6) \frac{a}{12p} + \frac{b-2}{4} - \frac{3-b}{3p} + 4p$$

$$= \frac{a + (b-2) - (3-b) + 48pp}{12p.}$$

$$= \frac{a - 5 + 48pp}{12p.}$$



II Kl

Aremetiske Opgaver 1885.

~~for~~

A Kiar.

N^o 1

$$\begin{aligned} & (3a-2b)(4-1)-(b-2)(a-3b) \\ & (6aa-4bb+3a-2b)-(ab-2a-3bb-6b) \\ & (6aa-4bb+3a-2b)-ab+2a+3bb+6b \\ & 6aa-4bb+3a-2b-ab+2a+3bb+6b \\ & -1bb+5a+4b. \end{aligned}$$

N^o 5

$$\begin{aligned} & -(a-(2-a)(3-2a)+b)-b-5) \\ & -(a-(2-a-3+2a+b)-b-5) \\ & | -(a-2+a+3-2a-b-b-5) \\ & \# -a-2-a-3+2a+b+b+5 \quad \checkmark \\ & C.A. + H \quad \quad \quad OSN \end{aligned}$$

Aritmetiske Opgaver

ved

Kalvaarsprøven 1885

Henrik Nilsen

Nr 1

$$\begin{aligned}
 & (3a-2b)(4-b) - (b-2)(a-3b) \\
 &= 12a - 8b - 3ab + 2bb - (ab - 2a - 3bb + 6b) \\
 &= 12a - 8b - 3ab + 2bb - ab + 2a + 3bb + 6b \\
 &= 14a - 14b - 4ab + 5bb \quad \checkmark
 \end{aligned}$$

~~Nr 3~~ Nr 4

$$\begin{aligned}
 & \frac{a}{12p} + \frac{b-2}{4} - \frac{3-b}{3p} + 4p \text{ trækkes sammen til en Brøk} \\
 &= \frac{a}{12ap} + \frac{3abp}{12ap} - \frac{12ap-b}{12ap} + \frac{12ap}{12ap} = \\
 &= \frac{a + 3abp - 12ap - b + 12ap}{12ap} \quad \checkmark
 \end{aligned}$$

Nr 5

$$\begin{aligned}
 & -(a - (2 - a - (3 - 2a)) + b) - b - 5 \\
 &= -(-a - (2 - a - (3 - 2a)) + b) - b - 5 \\
 &= -(a - (2 - a - 3 + 2a + b) - b - 5)
 \end{aligned}$$

$$= -(a - 2 + a + 3 + 2a - b - b - 5)$$

$$= +a + 2 - a - 3 + 2a + b + b + 5$$

$$= 4 + 2a + 2b \quad \checkmark$$

N₂ O

$$\frac{34}{82} \text{ Kr } \frac{27}{41} \text{ Pre} \longrightarrow \frac{215}{216} \text{ H}$$

$$\frac{34}{82} \text{ Kr} - \frac{27}{41} \text{ Pre} \longrightarrow \frac{215}{21600} \text{ H}$$

$$\frac{87.215.82}{41216000.34} = \frac{37.58.400}{1394}$$

$$\left. \begin{array}{r} 1394 \overline{) 3758400} \quad 2600 \quad \frac{125000}{1394} = \\ \underline{2788} \\ 9704 \\ \underline{8434} \\ 12500 \\ \underline{00000} \\ 125000 \\ \underline{000000} \\ 125000 \\ \underline{1394} \end{array} \right\} 26 \text{ Kr } \frac{125000}{1394}$$

I

Opgaver

ved

Halvaarscæmen:

1885

Knud Bøggild

$$\begin{aligned} \text{No 1)} & (3a-2b)(4-b) - (b-2)(a-3b) \\ &= (12a - 8b - 3ab + 2bb) - (ab - 2a - 2bb + 6b) \end{aligned}$$

$$= 12a - 8b - 3ab + 2bb - ab + 2a$$

$$+ 2bb + 6b$$

$$= 14a + 14b + 4ab + 2bb + 2a$$

No 2)

Hvilke Brøker med
Nævneren n ligger imellem
 a og $(a+1)$

$$= \frac{a \cdot n}{n} \frac{a \cdot n}{n} \frac{a \cdot n}{n} \frac{a \cdot n}{n} \dots$$

$(a+1)$



No 3)

$6ap - 2an - 12p + 4n$ galvies
i Factorer

$$= 2p(2a-4) 2n(a+2) //$$

No 5)

$$\begin{aligned} & -(-a - (2-a - (3-2a) + b) - b - 5) \\ & = -(-a - (2-a - 3 + 2a + b) - b - 5) \\ & = -(-a - 2 + a + 3 - 2a - b - b - 5) \\ & = +a + 2 - a - 3 + 2a + b + b + 5 \\ & = +2a + 4 + \overset{2b}{bb} \end{aligned}$$

I Hl.

Mathematisk Eksamener.

ved

Høiværksprøve 1885.

H. Christensen.

No 1.

$$\begin{aligned}
 & (3a-2b)(4-b) - (b-2)(a-3b) \\
 = & (12a-8b-3ab+2bb) - (b-2)(a-3b) \\
 = & (12a-8b-3ab+2bb) - (ab-2a-3bb+6b) \\
 = & 12a-8b-3ab+2bb-ab+2a+3bb-6b \\
 = & 14a-14b-4ab+5bb.
 \end{aligned}$$

No 4

$$\frac{a}{12p} + \frac{b-2}{4} - \frac{3-b}{3p} + 4 \text{ trækkes samment i en Brøk}$$

Generalnavner 12p

$$\frac{a + 3bp - 6p - 12 + 4b + 48}{12p}$$

No 5

$$\begin{aligned}
 & -(-a-(2-a-(3-2a)+6b)-b-5) \\
 = & -(-a-(2-a-3+2a+6b)-b-5) \\
 = & -(-a-2+a+3-2a-6b-b-5) \\
 = & +a+2-a-3+2a+6b+b+5.
 \end{aligned}$$

4. A.

No 6.

$$\frac{43}{82} K_v - 2 \frac{7}{41} P_{re} - \frac{215}{216} H$$
$$= 4 \frac{22919}{190404} Q.$$

1^{ste} Kl

Regneargaver

ved

Kalvaarsexamen 1885

Alfred Haas.

$$1 / (3a - 2b)(4 - b) - (b - 2)(a - 3b)$$

$$(12a - 8b - 3ab + 2bb) - (ab - 2a - 3bb + 6b)$$

$$12a - 8b - 3ab + 2bb - ab + 2a + 3bb - 6b$$

$$14a - 14b - 4ab + 5bb \quad \checkmark$$

$$- 14b$$

$$5 / -(-a - (2 - a - (3 - 2a) + b) - b - 5)$$

$$-(-a - (2 - a - 3 + 2a + b) - b - 5)$$

$$-(-a - 2 + a + 3 - 2a - b - b - 5)$$

$$+a + 2 - a - 3 + 2a + b + b + 5$$

$$24 + 2a + 2b \quad \checkmark$$

$$4 + 2a + 2b$$

$$\begin{array}{r} 6 \overline{) 43} \text{ Kr} \quad 2 \overline{) 41} \text{ Kr} \quad - \quad 2 \overline{) 15} \text{ Kr} \\ 82 \\ \hline 89 \quad 21500 \\ 41 \quad 21600 \\ \hline 43 \\ 82 \end{array}$$

$$\begin{array}{r} 44500 \\ + 913500 \\ \hline 885600 \\ 10800 \end{array} \quad \begin{array}{r} 82 \\ 43 \end{array} \quad \begin{array}{r} 44500 = 4 \overline{) 10800} \text{ Kr} \\ 10800 \end{array}$$

4) $\frac{a}{12n} + \frac{b-2}{4} - \frac{3-b}{3n} + 4n$ trekkes
sammen til en brøk

Arismetiske Opgaver
ved

Halvsarssexamen 1885
Rudolf Abel

$$\begin{aligned}
 5) & -(a - (2a - (3 - 2a) + b) - b - 5) \\
 & = -(a - 2a - 3 + 2a + b - b - 5) \\
 & = a + 2 - a + 3 - 2a - b + b + 5 \\
 & = -2a + 10
 \end{aligned}$$

$$\begin{array}{r}
 6) \frac{43}{82} \text{ hr} - 2\frac{7}{11} \text{ hr} - \frac{3\frac{1}{2}}{2\frac{1}{6}} \text{ to} \\
 \hline
 \frac{89}{41} \text{ hr} \\
 \hline
 120 - 4\frac{13}{13} \frac{165}{176} - \frac{3\frac{1}{2}}{2\frac{1}{6}} \text{ to}
 \end{array}$$

$$2(3a-2b)(4b)-(8-2)(a-3b)$$

$$= (12a-3ab-8b+2bb) - (8a-3bb-2a+6b)$$

$$= 12a-3ab-8b+2bb-8a+3bb+2a-6b$$

$$= 4a-4ab-14b+5bb$$

2) Hvilke Brikker med n til Kerner ligger imellem a og $(a+1)$?

$= \frac{a \cdot n}{n}$ og $\frac{(a+1) \cdot n}{n}$ De Brikker med n til Kerner, som ligger imellem a og $(a+1)$ er: $\frac{a \cdot n+1}{n}$ og $\frac{a \cdot n+2}{n}$ og $\frac{a \cdot n+3}{n}$
 $\dots, \frac{a \cdot n+n-1}{n}$ og $\frac{a \cdot n+n}{n}$

3) $6ap-2an-12p+4n$ opløses i Faktorer

$$6p(6ap-12p)-2n(-2an+4n)$$

$$(a-2)(a-2)$$

4) $\frac{a}{12p} + \frac{b \cdot 2}{4} - \frac{3 \cdot b}{3p} + \frac{4p}{p}$ trækkes sammen til en Brik

$$= \frac{a}{12p} + \frac{b \cdot 2}{4} - \frac{3 \cdot b}{3p} + \frac{4p \cdot p}{p}$$

Generalnævner 48p

$$\frac{a + 12p \cdot b \cdot 2 + 48 \cdot 4p \cdot p - 3 \cdot b}{48p}$$

$$\frac{(4a) + (12p \cdot b \cdot 2) + (48 \cdot 4p \cdot p) - 16 \cdot 3 \cdot b}{48p}$$

Generalnævner 48p

I Kl

Matematiske Opgaver

ved

Halvaarsprøven 1885

Bertel Bertelsen.

$$\begin{aligned}
 & 1) (3a-2b)(4-b) - (b-2)(a-3b) \\
 & = (12a - 8b - 3ab + 2bb) - (ab - 2a - 3bb + 6b) \\
 & = 12a - 8b - 3ab + 2bb - ab + 2a + 3bb - 6b \\
 & = 14a - 14b - 4ab + 5bb
 \end{aligned}$$

2) Hvilke Brøker med Nævnen n ligger imellem a og $(a-1)$?

$$\begin{aligned}
 a &= \frac{an}{n} \\
 (a-1) &= \frac{(a-1)n}{n} = \frac{an-n}{n}
 \end{aligned}$$

Brøkerne ere. $\frac{an+1}{n}, \frac{an+2}{n},$
 $\frac{an+3}{n}, \dots, \frac{(an-n)-1}{n}$

$$\begin{aligned}
 & 3) 6ap - 2an - 12pv + 4n \text{ opløses i Faktorer} \\
 & = 6p(a-2) - 2n(a-2) \\
 & = (a-2)(6p-2n)
 \end{aligned}$$

$$\begin{aligned}
 & \frac{4}{12}a + \frac{b-2}{4} - \frac{3-b}{3} + 4 \\
 &= \frac{a}{12} + \frac{(b-2)3}{12} - \frac{(3-b)4}{12} + \frac{4 \cdot 12}{12} \\
 &= \frac{a}{12} + \frac{3b-6}{12} - \frac{12-4b}{12} + \frac{48}{12} \\
 &= \frac{a+3b-6-12+4b+48}{12}
 \end{aligned}$$

$$\begin{aligned}
 & -(-a-(2-a-(3-2a))+b)-b-5 \\
 &= -(-a-(2-a-3+2a)+b)-b-5 \\
 &= -(-a-2+a+3-2a-b-b-5) \\
 &= a+2-a-3+2a+b+b+5 \\
 &= 4+2a+2b
 \end{aligned}$$

$$\begin{aligned}
 & \frac{43}{82} Kr - 2 \frac{7}{41} Lr - \frac{215}{216} Ab \\
 &= \frac{89}{41} \cdot \frac{215}{216} \cdot 100 : \frac{82}{82} \\
 &= \frac{89}{41} \cdot \frac{215}{216} \cdot 100 \cdot \frac{82}{82} \\
 &= \frac{89 \cdot 5 \cdot 100 \cdot 2}{216} \\
 &= \frac{89000}{216} = 4 Kr 12 \frac{27}{216} Lr
 \end{aligned}$$