Graad 8 – Boek B

(Onderwysers Handleiding)

(Hersiene KABV uitgawe)

INHOUDSOPGAWE:

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Hoofstuk B1

Rasionale getalle – gewone breuke

B1.1 Getallestelsels:

Voltooi:
Rasionale getalle: $\mathbb{Q} = \{ \frac{a}{b} \mid a, b \in \mathbb{Z} ; b \neq 0 \}$

Onthou die eienskappe van 1: (i) $a \times 1 = a$
(ii) $\frac{a}{1} = a$
(iii) $\frac{a}{a} = 1$

B1.2 Ekwivalente breuke:

Vb.1 Skryf twee ekwivalente breuke neer vir $\frac{1}{2}$:

$\frac{1 \times 3}{2 \times 3} = \frac{3}{6}$ *of* $\frac{1 \times 5}{2 \times 5} = \frac{5}{10}$ *[Hierdie is net* ***moontlike*** *antwoorde!]*

Oefening 1:

(1) Skryf drie ekwivalente breuke neer vir **elk van die** volgende **rasionale** getalle:
(Hierdie is slegs moontlike antwoorde! Baie ander moontlikhede.)

(a) $\frac{2}{3} = \frac{4}{6} = \frac{6}{9} = \frac{10}{15}$
(b) $\frac{1}{4} = \frac{2}{8} = \frac{10}{40} = \frac{100}{400}$
(c) $\frac{-1}{3} = \frac{-2}{6} = \frac{-5}{15} = \frac{4}{-12}$
(d) $\frac{2}{5} = \frac{-4}{-10} = \frac{6}{15} = \frac{20}{50}$
(e) $\frac{2}{-7} = \frac{10}{-35} = \frac{-20}{70} = \frac{16}{-56}$
(f) $\frac{-4}{3} = \frac{-8}{6} = \frac{-12}{9} = \frac{-20}{15}$
(g) $\frac{1}{6} = \frac{2}{12} = \frac{3}{18} = \frac{11}{66}$
(h) $\frac{3}{2} = \frac{21}{14} = 1\frac{1}{2} = \frac{30}{20}$
(i) $\frac{10}{14} = \frac{5}{7} = \frac{20}{28} = \frac{-15}{-21}$
(j) $\frac{-36}{-9} = \frac{36}{9} = \frac{4}{1} = \frac{12}{3}$
(k) $2\frac{6}{11} = 2\frac{12}{22} = \frac{28}{11} = 2\frac{24}{44}$
(l) $3 = \frac{3}{1} = \frac{6}{2} = \frac{30}{10}$

(2) Is die volgende ekwivalente breuke of nie? (Antwoord net ja of nee.)

(a) $\frac{1}{2} = \frac{7}{14}$ Ja
(b) $\frac{3}{7} = \frac{7}{3}$ Nee
(c) $\frac{5}{-2} = \frac{10}{4}$ Nee
(d) $\frac{-3}{-5} = \frac{9}{15}$ Ja
(e) $\frac{2}{3} = \frac{5}{6}$ Nee
(f) $\frac{3}{1} = \frac{48}{16}$ Ja
(g) $\frac{4}{-3} = \frac{-12}{9}$ Ja
(h) $\frac{25}{10} = \frac{5}{2}$ Ja
(i) $\frac{5}{4} = \frac{25}{16}$ Nee

(3) Voltooi die volgende ekwivalente breuke:

(a) $\frac{3}{8} \overset{\times 3}{\underset{\times 3}{=}} \frac{9}{24}$
(b) $\frac{12}{14} = \frac{6 \times 2}{7 \times 2}$
(c) $\frac{3 \times -2}{3 \times 9} = \frac{-6}{27}$
(d) $\frac{5}{6} = \frac{35 \div 7}{42 \div 7}$
(e) $\frac{-3}{-4} = \frac{12 \div -4}{16 \div -4}$
(f) $\frac{4}{3} \overset{\times 3}{\underset{\times 3}{=}} 1\frac{1}{3} = \frac{12}{9}$
(g) $\frac{3 \div -6}{3 \div 33} = \frac{-4}{22}$
$\searrow \frac{-2}{11} \times \frac{2}{2} \nearrow$
(h) $3\frac{2}{5} = \frac{-34}{-10}$
$\frac{17}{5} \times \frac{-2}{-2} \nearrow$
(i) $\frac{6}{6} = \frac{11}{11} = 1$

B1.3 Ordening van rasionale getalle:

Vb.2 (a) Rangskik die volgende breuke in stygende volgorde: $\frac{1}{2}$; $\frac{3}{4}$ *en* $\frac{2}{3}$

$\frac{1}{2} = \frac{6}{12}$; $\frac{3}{4} = \frac{9}{12}$ *en* $\frac{2}{3} = \frac{8}{12}$

$\therefore \frac{1}{2} < \frac{2}{3} < \frac{3}{4}$

(b) Skryf 'n rasionale getal neer tussen $\frac{3}{4}$ *en* $\frac{1}{3}$*:*

$\frac{3}{4} = \frac{9}{12}$ *en* $\frac{1}{3} = \frac{4}{12}$

$\therefore \frac{1}{3} < \frac{5}{12}$ ***of*** $\frac{6}{12}$ ***of*** $\frac{7}{12}$ ***of*** $\frac{8}{12} < \frac{3}{4}$

Oefening 2:

(1) Rangskik die volgende breuke in stygende volgorde:

(a) $\frac{5}{6}$; $\frac{3}{4}$ en $\frac{4}{5}$

$\therefore \frac{5}{6} = \frac{50}{60}$; $\frac{3}{4} = \frac{45}{60}$; $\frac{4}{5} = \frac{48}{60}$

$\therefore \frac{3}{4} < \frac{4}{5} < \frac{5}{6}$

(b) $\frac{2}{3}$; $\frac{5}{7}$ en $\frac{4}{6}$

$\therefore \frac{2}{3} = \frac{28}{42}$; $\frac{5}{7} = \frac{30}{42}$; $\frac{4}{6} = \frac{28}{42}$

$\therefore \frac{2}{3} = \frac{4}{6} < \frac{5}{7}$

(c) $\frac{1}{2}$; $\frac{2}{3}$ en $\frac{5}{6}$

$\therefore \frac{1}{2} = \frac{3}{6}$; $\frac{2}{3} = \frac{4}{6}$; $\frac{5}{6} = \frac{5}{6}$

$\therefore \frac{1}{2} < \frac{2}{3} < \frac{5}{6}$

(d) $\frac{-3}{7}$; $\frac{-1}{3}$ en $\frac{-2}{5}$

$\therefore \frac{-3}{7} = \frac{-45}{105}$; $\frac{-1}{3} = \frac{-35}{105}$; $\frac{-2}{5} = \frac{-42}{105}$

$\therefore \frac{-3}{7} < \frac{-2}{5} < \frac{-1}{3}$

(2) Rangskik die volgende breuke in dalende volgorde:

(a) $\frac{3}{8}$; $\frac{2}{3}$ en $\frac{5}{6}$

$\therefore \frac{3}{8} = \frac{9}{24}$; $\frac{2}{3} = \frac{16}{24}$; $\frac{5}{6} = \frac{20}{24}$

$\therefore \frac{5}{6} > \frac{2}{3} > \frac{3}{8}$

(b) $\frac{3}{5}$; $\frac{5}{7}$ en $\frac{6}{8}$

$\therefore \frac{3}{5} = \frac{84}{140}$; $\frac{5}{7} = \frac{100}{140}$; $\frac{6}{8} = \frac{3}{4} = \frac{105}{140}$

$\therefore \frac{6}{8} > \frac{5}{7} > \frac{3}{5}$

(c) $\frac{-1}{2}$; $\frac{-2}{3}$ en $\frac{-3}{5}$

$\therefore \frac{-1}{2} = \frac{-15}{30}$; $\frac{-2}{3} = \frac{-20}{30}$; $\frac{-3}{5} = \frac{-18}{30}$

$\therefore -\frac{1}{2} > -\frac{3}{5} > -\frac{2}{3}$

(d) $\frac{2}{4}$; $\frac{6}{12}$ en $\frac{-5}{-10}$

$\therefore \frac{2}{4} = \frac{30}{60}$; $\frac{6}{12} = \frac{30}{60}$; $\frac{-5}{-10} = \frac{30}{60}$

$\therefore \frac{2}{4} = \frac{6}{12} = \frac{-5}{-10}$

(3) Plaas telkens 'n rasionale getal tussen die volgende getalle: (Moontlike antwoorde.)

(a) $\frac{5}{6}$ en $\frac{3}{4}$

$\frac{5}{6} = \frac{20}{24}$ en $\frac{3}{4} = \frac{18}{24}$

$\therefore \frac{3}{4} < \frac{19}{24} < \frac{5}{6}$

(b) $\frac{-1}{3}$ en $\frac{-3}{5}$

$-\frac{1}{3} = \frac{-5}{15}$ en $\frac{-3}{5} = \frac{-9}{15}$

$\therefore -\frac{1}{3} > -\frac{7}{15} > -\frac{3}{5}$

Kon ook wees $-\frac{6}{15}$ of $-\frac{8}{15}$

(c) $\frac{1}{2}$ en $\frac{3}{8}$

$\frac{1}{2} = \frac{4}{8} = \frac{8}{16}$ en $\frac{3}{8} = \frac{6}{16}$

$\therefore \underrightarrow{\frac{3}{8} < \frac{7}{16} < \frac{1}{2}}$

(e) $\frac{-3}{9}$ en $\frac{-5}{12}$

$\frac{-3}{9} = \frac{-12}{36}$ en $\frac{-5}{12} = \frac{-15}{36}$

$\therefore \underrightarrow{-\frac{5}{12} < -\frac{13}{36} < -\frac{3}{9}}$

Kan ook wees : $\frac{-14}{36}$

(d) $\frac{6}{7}$ en $\frac{7}{10}$

$\frac{6}{7} = \frac{60}{70}$ en $\frac{7}{10} = \frac{49}{70}$

$\therefore \underrightarrow{\frac{7}{10} < \frac{55}{70} < \frac{6}{7}}$

Kan ook wees: $\frac{50}{70}$. $\cdots\cdots$ $\frac{59}{70}$

(f) $\frac{5}{2}$ en 3

$\frac{5}{2} = \frac{10}{4}$ en $\frac{3}{1} = \frac{6}{2} = \frac{12}{4}$

$\therefore \underrightarrow{\frac{5}{2} < \frac{11}{4} < 3}$

☺ **Daar is vier ewe groot koeke. Danie eet $\frac{3}{8}$ van die eerste koek. Phillip eet $\frac{4}{9}$ van die tweede koek. André eet $\frac{1}{2}$ van die derde koek en Manie eet $\frac{4}{6}$ van die laaste koek. Van wie se koek het die meeste oorgebly?**

$\frac{3}{8} = \frac{27}{72}$ ⟶ Danie eet ⟶ $\therefore$ $\frac{45}{72}$ bly oor.

$\frac{4}{9} = \frac{32}{72}$ ⟶ Phillip eet ⟶ $\therefore$ $\frac{40}{72}$ bly oor.

$\frac{1}{2} = \frac{36}{72}$ ⟶ André eet ⟶ $\therefore$ $\frac{36}{72}$ bly oor.

$\frac{4}{6} = \frac{48}{72}$ ⟶ Manie eet ⟶ $\therefore$ $\frac{24}{72}$ bly oor.

$\therefore$ Van Danie se koek het meeste oorgebly.

B1.4 Optel en aftrek van breuke:

Vb.3 Vereenvoudig:

(*a*)

$$\frac{1}{2} + \frac{4}{3} - \frac{3}{4}$$

$$= \frac{1}{2}\times\frac{6}{6} + \frac{4}{3}\times\frac{4}{4} - \frac{3}{4}\times\frac{3}{3}$$

$$= \frac{6}{12} + \frac{16}{12} - \frac{9}{12}$$

$$= \frac{6 + 16 - 9}{12}$$

$$= \frac{13}{12}$$

$$= \underline{1\frac{1}{12}}$$

(*b*)

$$3x + \frac{2}{3}y - \frac{3}{5}x + 1\frac{3}{4}y$$

$$= \frac{3}{1}x - \frac{3}{5}x + \frac{2}{3}y + \frac{7}{4}y$$

$$= \frac{5}{5}\times\frac{3}{1}x - \frac{3}{5}x + \frac{4}{4}\times\frac{2}{3}y + \frac{3}{3}\times\frac{7}{4}y$$

$$= \frac{15}{5}x - \frac{3}{5}x + \frac{8}{12}y + \frac{21}{12}y$$

$$= \frac{15x - 3x}{5} + \frac{8y + 21y}{12}$$

$$= \frac{12x}{5} + \frac{29y}{12} = \underline{2\frac{2}{5}x + 2\frac{5}{12}y}$$

Oefening 3:
Vereenvoudig:

(1) $\frac{5}{5}\times\frac{1}{3} + \frac{4}{5}\times\frac{3}{3}$

$= \frac{5}{15} + \frac{12}{15}$

$= \frac{17}{15}$

$= 1\frac{2}{15}$

(2) $\frac{5}{5}\times\frac{3}{7} - \frac{3}{5}\times\frac{7}{7}$

$= \frac{15}{35} - \frac{21}{35}$

$= \frac{-6}{35}$

(3) $\frac{1}{4} + 1\frac{1}{2} - \frac{5}{8}$

$= \frac{1}{4} + \frac{3}{2} - \frac{5}{8}$

$= \frac{2}{8} + \frac{12}{8} - \frac{5}{8}$

$= \frac{9}{8} = 1\frac{1}{8}$

(4) $2\frac{7}{10} + 3\frac{9}{10}$

$= \frac{27}{10} + \frac{39}{10}$

$= \frac{66}{10}$

$= 6\frac{6}{10}$

$= 6\frac{3}{5}$

(5) $2\frac{1}{3} - 3$

$= \frac{7}{3} - \frac{3}{1}\times\frac{3}{3}$

$= \frac{7}{3} - \frac{9}{3}$

$= \frac{-2}{3}$

(6) $-1\frac{2}{5} + 2\frac{1}{10}$

$= \frac{-7}{5} + \frac{21}{10}$

$= \frac{-14}{10} + \frac{21}{10}$

$= \frac{-14+21}{10}$

$= \frac{7}{10}$

(7) $\frac{3}{3}\times\frac{5}{8} + \frac{7}{12}\times\frac{2}{2}$

$= \frac{15}{24} + \frac{14}{24}$

$= \frac{15+14}{24}$

$= \frac{29}{24}$

$= 1\frac{5}{24}$

(8) $\frac{1}{5} - 2\frac{2}{3} - \frac{5}{6}$

$= \frac{1}{5} - \frac{8}{3} - \frac{5}{6}$

$= \frac{6}{30} - \frac{80}{30} - \frac{25}{30}$

$= \frac{-99}{30}$

$= -3\frac{9}{30} = -3\frac{3}{10}$

(9) $4\frac{4}{5} - 3\frac{7}{10}$

$= \frac{24}{5} - \frac{37}{10}$

$= \frac{48}{10} - \frac{37}{10}$

$= \frac{11}{10}$

$= 1\frac{1}{10}$

(10) $\frac{3}{4} + \frac{2}{3}$

$= \frac{9}{12} + \frac{8}{12}$

$= \frac{17}{12}$

$= 1\frac{5}{12}$

(11) $4\frac{1}{2} - \frac{2}{5} + \frac{5}{6}$

$= \frac{9}{2} - \frac{2}{5} + \frac{5}{6}$

$= \frac{135}{30} - \frac{12}{30} + \frac{25}{30}$

$= \frac{148}{30}$

$= 4\frac{28}{30} = 4\frac{14}{15}$

(12) $\left(\frac{3}{7} - \frac{2}{6}\right) - \left(\frac{1}{3} + \frac{1}{7}\right)$

$= \left(\frac{18}{42} - \frac{14}{42}\right) - \left(\frac{7}{21} + \frac{3}{21}\right)$

$= \frac{4}{42} - \frac{10}{21}$

$= \frac{4}{42} - \frac{20}{42}$

$= \frac{-16}{42} = -\frac{8}{21}$

(13) $\frac{3}{8}p - \frac{3}{4}p$

$= \frac{3p}{8} - \frac{3p}{4}$

$= \frac{3p}{8} - \frac{6p}{8}$

$= \frac{-3p}{8}$

(14) $\frac{1}{6} - \frac{1}{3} - \frac{1}{4}$

$= \frac{2}{12} - \frac{4}{12} - \frac{3}{12}$

$= \frac{-5}{12}$

(15) $\left(\frac{6}{1}-\frac{1}{4}\right)+\left(\frac{1}{5}-1\right)$

$=\left(\frac{24}{4}-\frac{1}{4}\right)+\left(\frac{1}{5}-\frac{5}{5}\right)$

$=\frac{23}{4}+\frac{-4}{5}$

$=\frac{115}{20}-\frac{16}{20}$

$=\frac{99}{20}=4\frac{19}{20}$

(16) $\frac{4}{3}+\frac{6}{5}-\frac{5}{4}$

$=\frac{80}{60}+\frac{72}{60}-\frac{75}{60}$

$=\frac{77}{60}$

$=1\frac{17}{60}$

(17) $\frac{1}{12}-15\frac{3}{8}+1$

$=\frac{1}{12}-\frac{123}{8}+1$

$=\frac{2}{24}-\frac{369}{24}+\frac{24}{24}$

$=\frac{-343}{24}$

$=-14\frac{7}{24}$

(18) $\frac{3}{5}-\left(3\frac{1}{3}+\frac{1}{2}\right)-\frac{4}{6}$

$=\frac{3}{5}-\left(\frac{10}{3}+\frac{1}{2}\right)-\frac{4}{6}$

$=\frac{3}{5}-\left(\frac{20}{6}+\frac{3}{6}\right)-\frac{4}{6}$

$=\frac{18}{30}-\frac{115}{30}-\frac{20}{30}$

$=\frac{-117}{30}=-3\frac{27}{30}=-3\frac{9}{10}$

(19) $8-2\frac{1}{9}+\frac{7}{3}$

$=\frac{8}{1}-\frac{19}{9}+\frac{7}{3}$

$=\frac{72}{9}-\frac{19}{9}+\frac{21}{9}$

$=\frac{74}{9}$

$=8\frac{2}{9}$

(20) $\frac{2}{3}x+\frac{1}{6}x$

$=\frac{2x}{3}+\frac{1x}{6}$

$=\frac{4x}{6}+\frac{1x}{6}$

$=\frac{4x+1x}{6}$

$=\frac{5x}{6}$

(21) $\frac{1}{2}p-3q+7\frac{1}{4}p-\frac{1}{3}q$

$=\frac{1p}{2}-\frac{3q}{1}+\frac{29p}{4}-\frac{1q}{3}$

$=\frac{6p}{12}-\frac{36q}{12}+\frac{87p}{12}-\frac{4q}{12}$

$=\frac{6p-36q+87p-4q}{12}$

$=\frac{93p-40q}{12}$

(22) $-3\frac{1}{5}-\left(-\frac{7}{10}\right)$

$=\frac{-16}{5}+\frac{7}{10}$

$=\frac{-32}{10}+\frac{7}{10}$

$=\frac{-25}{10}$

$=-2\frac{5}{10}=-2\frac{1}{2}$

(23) $1\frac{1}{2}+2\frac{2}{3}+3\frac{1}{6}$

$=\frac{3}{2}+\frac{8}{3}+\frac{19}{6}$

$=\frac{9}{6}+\frac{16}{6}+\frac{19}{6}$

$=\frac{44}{6}$

$=7\frac{2}{6}=7\frac{1}{3}$

(24) $4\frac{1}{2}y+3\frac{1}{4}y-2\frac{2}{3}y$

$=\frac{9}{2}y+\frac{13}{4}y-\frac{8}{3}y$

$=\frac{54y}{12}+\frac{39y}{12}-\frac{32y}{12}$

$=\frac{61y}{12}$

$=5\frac{1}{12}y$

(25) $\frac{3}{5}m + \frac{4}{6}m$

$= \frac{3m}{5} + \frac{4m}{6}$

$= \frac{18m}{30} + \frac{20m}{30}$

$= \frac{38m}{30}$

$= 1\frac{8}{30}m = 1\frac{4}{15}m$

(26) $6\frac{3}{4} - \left(2\frac{1}{3} - 1\frac{1}{3}\right)$

$= 6\frac{3}{4} - \left(\frac{7}{3} - \frac{4}{3}\right)$

$= 6\frac{3}{4} - \frac{3}{3}$

$= 6\frac{3}{4} - 1$

$= 5\frac{3}{4}$

(27) $\frac{-10}{11}xy + \frac{1}{2}x + \frac{1}{2}xy$

$= \frac{-10xy}{11} + \frac{1xy}{2} + \frac{1x}{2}$

$= \frac{-20xy}{22} + \frac{11xy}{22} + \frac{11x}{22}$

$= \frac{-20xy + 11xy + 11x}{22}$

$= \frac{-9xy + 11x}{22}$

(28) $25\frac{3}{20} - 33\frac{3}{20}$

$= -8$

(29) $\left(3\frac{1}{4} - 2\frac{1}{5}\right) - 2\frac{1}{4}$

$= \left(\frac{13}{4} - \frac{11}{5}\right) - \frac{9}{4}$

$= \left(\frac{65}{20} - \frac{44}{20}\right) - \frac{9}{4}$

$= \frac{21}{20} - \frac{45}{20}$

$= \frac{-24}{20} = -1\frac{4}{20} = -1\frac{1}{5}$

(30) $\frac{3}{4}m - \frac{1}{2}k + \frac{1}{2}k + \frac{3}{4}m$

$= \frac{3m}{4} - \frac{1k}{2} + \frac{1k}{2} + \frac{3m}{4}$

$= \frac{3m}{4} - \frac{2k}{4} + \frac{2k}{4} + \frac{3m}{4}$

$= \frac{3m - 2k + 2k + 3m}{4}$

$= \frac{6m}{4} = \frac{3m}{2}$

Vb.4 Vereenvoudig : (a) $\frac{2}{3x} + \frac{6}{x}$

$= \frac{2}{3x} + \frac{6}{x} \times \frac{3}{3}$

$= \frac{2 + 18}{3x} = \underline{\frac{20}{3x}}$

(b) $\frac{y}{2} - \frac{y^2}{5}$

$= \frac{y}{2} \times \frac{5}{5} - \frac{y^2}{5} \times \frac{2}{2}$

$= \underline{\frac{5y - 2y^2}{10}}$

Oefening 4:

Vereenvoudig:

(1) $\frac{3}{3} \times \frac{m}{2} + \frac{2m}{3} \times \frac{2}{2}$

$= \frac{3m}{6} + \frac{4m}{6}$

$= \frac{7m}{6}$

$= 1\frac{1}{6}m$

(2) $\frac{x}{x} \times \frac{5}{x} - \frac{3}{x^2}$

$= \frac{5x}{x^2} - \frac{3}{x^2}$

$= \frac{5x - 3}{x^2}$

(3) $\frac{2y}{5} - \frac{y^2}{3} - \frac{1}{2}$

$= \frac{12y}{30} - \frac{10y^2}{30} - \frac{15}{30}$

$= \frac{12y - 10y^2 - 15}{30}$

(4) $-\frac{1}{4}q+\frac{2}{3}q$

$=\frac{-1q}{4}+\frac{2q}{3}$

$=\frac{-3q}{12}+\frac{8q}{12}$

$=\frac{5q}{12}$

(5) $\frac{k}{1}-\frac{4}{1}-\frac{2}{k^2}$

$=\frac{k^3}{k^2}-\frac{4k^2}{k^2}-\frac{2}{k^2}$

$=\frac{k^3-4k^2-2}{k^2}$

(6) $\frac{2}{2}\times\frac{2}{x}+\frac{x}{2}\times\frac{x}{x}$

$=\frac{4}{2x}+\frac{x^2}{2x}$

$=\frac{4+x^2}{2x}$

(7) $\frac{3}{a}-\frac{2}{c}+1$

$=\frac{3c}{ac}-\frac{2a}{ac}+\frac{ac}{ac}$

$=\frac{3c-2a+ac}{ac}$

(8) $\frac{-x^2}{5}+\frac{x}{4}-\frac{1}{2}$

$=\frac{-4x^2}{20}+\frac{5x}{20}-\frac{10}{20}$

$=\frac{-4x^2+5x-10}{20}$

(9) $c+\frac{3c}{7}-2$

$=\frac{c}{1}+\frac{3c}{7}-\frac{2}{1}$

$=\frac{7c}{7}+\frac{3c}{7}-\frac{14}{7}$

$=\frac{7c+3c-14}{7}$

$=\frac{10c-14}{7}$

(10) $\frac{5}{x}-\frac{3}{xy}$

$=\frac{5y}{xy}-\frac{3}{xy}$

$=\frac{5y-3}{xy}$

(11) $\frac{-2}{3p}+\frac{5}{2p}$

$=\frac{-4}{6p}+\frac{15}{6p}$

$=\frac{-4+15}{6p}$

$=\frac{11}{6p}$

(12) $\frac{4k}{7}-k$

$=\frac{4k}{7}-\frac{k}{1}$

$=\frac{4k}{7}-\frac{7k}{7}$

$=-\frac{3k}{7}$

☺ **Voltooi die volgende drie terme in die ry: $1\frac{3}{4}$; $2\frac{1}{4}$; $2\frac{3}{4}$;** $3\frac{1}{4}$; $3\frac{3}{4}$; $4\frac{1}{4}$

Kan jy voorspel wat die honderdste term gaan wees? Skryf die term neer. $51\frac{1}{4}$

B1.5 Vermenigvuldiging en deling:

Vb.5 Vereenvoudig : (a) $\frac{2}{3} \times \frac{8}{12}$

$= \frac{\cancel{2}^{1}}{3} \times \frac{8}{\cancel{12}^{6}}$

$= \frac{1}{3} \times \frac{\cancel{8}^{4}}{\cancel{6}^{3}}$

$= \underline{\frac{4}{9}}$

(b) $1\frac{1}{3} \div \frac{4}{15}$

$= \frac{4}{3} \times \frac{15}{4}$

$= \frac{\cancel{4}^{1}}{\cancel{3}^{1}} \times \frac{\cancel{15}^{5}}{\cancel{4}^{1}}$

$= \underline{5}$

Oefening 5:

Vereenvoudig:

(1) $\frac{\cancel{2}^{1}}{\cancel{3}} \times \frac{\cancel{3}}{\cancel{4}_{2}}$

$= \frac{1}{2}$

(2) $\frac{\overset{2}{\cancel{4}}}{5} \times \frac{7}{\cancel{8}_{1}}$

$= \frac{14}{5} = 2\frac{4}{5}$

(3) $\frac{5}{\cancel{3}_{1}} \times \frac{\cancel{9}^{3}}{2}$

$= \frac{15}{2} = 7\frac{1}{2}$

(4) $\frac{4}{7} \times \frac{5}{9}$

$= \frac{20}{63}$

(5) $\frac{{}^{3}\cancel{12}}{{}_{5}\cancel{25}} \times \frac{\cancel{15}^{3}}{\cancel{16}_{4}}$

$= \frac{9}{20}$

(6) $\frac{18}{\cancel{7}_{1}} \times \frac{\cancel{14}^{2}}{1}$

$= 36$

(7) $\frac{4}{5} \div \frac{3}{5}$

$= \frac{4}{\cancel{5}} \times \frac{\cancel{5}}{3}$

$= \frac{4}{3} = 1\frac{1}{3}$

(8) $1\frac{6}{7}$ van $4\frac{2}{3}$

$= \frac{13}{\cancel{7}_{1}} \times \frac{\cancel{14}^{2}}{3}$

$= \frac{26}{3} = 8\frac{2}{3}$

(9) $2 \div \frac{3}{4}$

$= \frac{2}{1} \times \frac{4}{3}$

$= \frac{8}{3} = 2\frac{2}{3}$

(10) $2\frac{4}{5} \div 4\frac{1}{5}$

$= \frac{14}{5} \div \frac{21}{5}$

$= \frac{\cancel{14}^{2}}{\cancel{5}} \times \frac{\cancel{5}}{\cancel{21}_{3}}$

$= \frac{2}{3}$

(11) $6 \div 2\frac{1}{4}$

$= \frac{6}{1} \div \frac{9}{4}$

$= \frac{\cancel{6}^{2}}{1} \times \frac{4}{\cancel{9}_{3}}$

$= \frac{8}{3} = 2\frac{2}{3}$

(12) $2\frac{2}{3} \times 1\frac{1}{5} \times 3\frac{3}{4}$

$= \frac{\cancel{8}^{2}}{\cancel{3}_{1}} \times \frac{\cancel{6}^{2}}{\cancel{5}_{1}} \times \frac{\cancel{15}^{3}}{\cancel{4}_{1}}$

$= 12$

(13) $6\frac{7}{8} \div 5$

$= \frac{55}{8} \div \frac{5}{1}$

$= \frac{{}^{11}\cancel{55}}{8} \times \frac{1}{\cancel{5}}$

$= \frac{11}{8}$

$= 1\frac{3}{8}$

(14) $\frac{-3}{9} \times 2\frac{1}{4}$

$= \frac{-3}{\cancel{9}_{1}} \times \frac{\cancel{9}^{1}}{4}$

$= \frac{-3}{4}$

(15) $-2\frac{2}{3} \div 4\frac{1}{2}$

$= \frac{-8}{3} \div \frac{9}{2}$

$= \frac{-8}{3} \times \frac{2}{9}$

$= \frac{-16}{27}$

(16) $5\frac{1}{7}$ van $\left(-2\frac{3}{4}\right)\div\frac{-5}{14}$

$= \frac{36}{7} \times \frac{-11}{4} \div \frac{-5}{14}$

$= \frac{\cancel{36}^{9}}{\cancel{7}_{1}} \times \frac{-11}{\cancel{4}_{1}} \times -\frac{\cancel{14}^{2}}{5}$

$= \frac{-198}{-5} = 39\frac{3}{5}$

(17) $6\frac{1}{4} \times \left(3\frac{3}{5} \div 3\frac{3}{4}\right)$

$= \frac{25}{4} \times \left(\frac{18}{5} \div \frac{15}{4}\right)$

$= \frac{\overset{5}{\cancel{25}}}{\cancel{4}_{1}} \times \frac{18}{\cancel{5}_{1}} \times \frac{\cancel{4}}{\cancel{15}_{3}}$

$= \frac{18}{3} = 6$

(18) $\frac{1}{3} \div \left(\frac{\cancel{2}}{3} \times \frac{1}{\cancel{2}}\right) \div 2$

$= \frac{1}{3} \div \frac{1}{3} \div \frac{2}{1}$

$= \frac{1}{\cancel{3}} \times \frac{\cancel{3}}{1} \times \frac{1}{2}$

$= \frac{1}{2}$

(19) $\frac{1}{3} \div \frac{-1}{6} \div 1\frac{3}{5}$

$= \frac{1}{3} \div \frac{-1}{6} \div \frac{8}{5}$

$= \frac{1}{\cancel{3}_{1}} \times \frac{\cancel{6}\,\cancel{3}^{1}}{-1} \times \frac{5}{\cancel{8}_{4}}$

$= \frac{5}{-4}$

$= -1\frac{1}{4}$

Vb.6 Vereenvoudig : (a) $\frac{4b}{12a} \times \frac{24a}{8b}$

$= \frac{{}^{1}\cancel{4b}}{{}^{1}\cancel{12a}} \times \frac{{}^{2}\cancel{24a}}{{}^{1}\cancel{8b}}$

$= \frac{2}{2}$

$= 1$

(b) $\frac{4y^2}{3} \div \frac{2y}{x}$

$= \frac{4y^2}{3} \times \frac{x}{2y}$

$= \frac{{}^{2}\cancel{4}\,y.\cancel{y}}{3} \times \frac{x}{\cancel{2y}}$

$= \frac{2xy}{3}$

<u>Oefening 6</u>:

Vereenvoudig:

(1) $\frac{\overset{2}{\cancel{6}}}{1} \times \frac{m}{\cancel{9}_{3}}$

$= \frac{2m}{3}$

(2) $\frac{4p^{\cancel{2}}}{\cancel{3}_{1}} \times \frac{\overset{2}{\cancel{6}}}{8\cancel{p}}$

$= \frac{\cancel{8}p}{\cancel{8}}$

$= p$

(3) $\frac{gh}{k} \div \frac{h}{gk}$

$= \frac{g\cancel{h}}{\cancel{k}} \times \frac{g\cancel{k}}{\cancel{h}}$

$= g^2$

(4) $\frac{-5x^{\cancel{2}}y}{\cancel{3}_{1}} \times \frac{\overset{5}{\cancel{15}}\cancel{x}}{\cancel{3x}}$

$= \frac{-25xy}{1}$

$= -25xy$

(5) $\frac{3p}{4q} \div \frac{-27}{2q}$

$= \frac{{}^{1}\cancel{3}p}{{}_{2}\cancel{4}\cancel{q}} \times \frac{\cancel{2}^{1}\cancel{q}}{\cancel{-27}_{9}}$

$= \frac{p}{-18}$

(6) $\frac{7m}{12n} \div \frac{14mn}{3}$

$= \frac{{}^{1}\cancel{7m}}{{}_{4}\cancel{12}n} \times \frac{\cancel{3}^{1}}{{}_{2}\cancel{14m}n}$

$= \frac{1}{8n^2}$