

9.5 Formules omwerken

Opgave 65:

$$y = \frac{2}{x}$$

$$xy = 2$$

$$x = \frac{2}{y}$$

Opgave 66:

a. $A = \frac{B}{B+2}$

$$A(B+2) = B$$

$$AB + 2A = B$$

$$AB - B = -2A$$

$$B(A-1) = -2A$$

$$B = \frac{-2A}{A-1} \quad \text{of} \quad B = \frac{2A}{1-A}$$

b. $P = \frac{Q-5}{Q}$

$$PQ = Q - 5$$

$$PQ - Q = -5$$

$$Q(P-1) = -5$$

$$Q = \frac{-5}{P-1} \quad \text{of} \quad Q = \frac{5}{1-P}$$

c. $R = \frac{F-2}{F-1}$

$$R(F-1) = F-2$$

$$RF - R = F - 2$$

$$RF - F = R - 2$$

$$F(R-1) = R-2$$

$$F = \frac{R-2}{R-1}$$

Opgave 67:

a. $p = 0,6$

$$K = 10492,5 \text{ dus } 10492,50 \text{ euro}$$

b. $p = 0,95$

$$K = 83905 \text{ dus } 83905 \text{ euro}$$

c. 100% dus $p = 1$ maar dat mag je niet invullen in de formule want dan wordt de noemer nul

d. $K = \frac{4200 - 5p}{1-p}$

$$K(1-p) = 4200 - 5p$$

$$K - Kp = 4200 - 5p$$

$$5p - Kp = 4200 - K$$

$$p(5 - K) = 4200 - K$$

$$p = \frac{4200 - K}{5 - K}$$

e. $p = 0,85$ dus 85%

Opgave 68:

a. $\frac{1}{a} = 2 + \frac{1}{b} = \frac{2b}{b} + \frac{1}{b} = \frac{2b+1}{b}$

b. $a(2b+1) = b$

$$a = \frac{b}{2b+1}$$

c. $\frac{1}{a} = 2 + \frac{1}{b}$

$$\frac{1}{a} - 2 = \frac{1}{b}$$

$$\frac{1}{a} - \frac{2a}{a} = \frac{1}{b}$$

$$\frac{1-2a}{a} = \frac{1}{b}$$

$$b = \frac{a}{1-2a}$$

Opgave 69:

a. $\frac{1}{p} = 5 - \frac{2}{q}$

$$\frac{1}{p} = \frac{5q}{q} - \frac{2}{q}$$

$$\frac{1}{p} = \frac{5q-2}{q}$$

$$p = \frac{q}{5q-2}$$

b. $\frac{1}{m} = \frac{1}{2} - \frac{3}{n}$

$$\frac{3}{n} = \frac{1}{2} - \frac{1}{m}$$

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

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

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

$$n = \frac{6m}{m-2}$$

Opgave 70:

a. $F = \frac{1}{K} + \frac{1}{2K}$

$$F = \frac{2}{2K} + \frac{1}{2K}$$

$$F = \frac{3}{2K}$$

$$K = \frac{3}{2F}$$

b. $N = \frac{2R+2}{5R+2}$

$$N(5R+2) = 2R+2$$

$$5NR+2N = 2R+2$$

$$5NR-2R = 2-2N$$

$$R(5N-2) = 2-2N$$

$$R = \frac{2-2N}{5N-2}$$

c. $\frac{1}{T} = 10 - \frac{2}{S}$

$$\frac{1}{T} = \frac{10S}{S} - \frac{2}{S}$$

$$\frac{1}{T} = \frac{10S-2}{S}$$

$$T = \frac{S}{10S-2}$$

d. $\frac{6}{B} = \frac{5}{8} - \frac{2}{A}$

$$\frac{2}{A} = \frac{5}{8} - \frac{6}{B}$$

$$\frac{2}{A} = \frac{5B}{8B} - \frac{48}{8B}$$

$$\frac{2}{A} = \frac{5B-48}{8B}$$

$$\frac{A}{2} = \frac{8B}{5B-48}$$

$$A = \frac{16B}{5B-48}$$

Opgave 71:

a. $\frac{1}{3} = \frac{1}{b} + \frac{1}{v}$

$$\frac{1}{3} - \frac{1}{v} = \frac{1}{b}$$

$$\frac{v}{3v} - \frac{3}{3v} = \frac{1}{b}$$

$$\frac{v-3}{3v} = \frac{1}{b}$$

$$b = \frac{3v}{v-3}$$

b. H.A.: $b = 3$

V.A.: $v = 3$

H.A.: als het voorwerp ver weg staat is de beeldafstand 3 cm

V.A.: als $v = 3$ is er geen beeld

c. $v = b$

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

$$v(v-3) = 3v$$

$$v^2 - 3v = 3v$$

$$v^2 - 6v = 0$$

$$v(v-6) = 0$$

$$v = 0 \quad \vee \quad v = 6$$

dus als $v = 6$ cm

d. $\frac{b}{v} = 2$

$$b = 2v$$

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

$$2v(v-3) = 3v$$

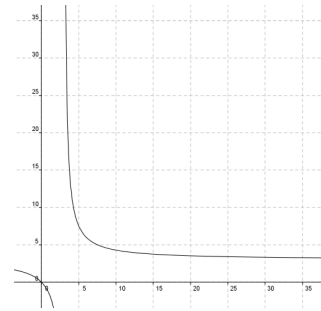
$$2v^2 - 6v = 3v$$

$$2v^2 - 9v = 0$$

$$2v(v - 4\frac{1}{2}) = 0$$

$$v = 0 \quad \vee \quad v = 4\frac{1}{2}$$

dus als $v = 4\frac{1}{2}$ cm



Opgave 72:

a. $y = \log(2x+1)$

$$y = {}^{10}\log(2x+1)$$

$$2x+1 = 10^y$$

b. $2x = -1 + 10^y$

$$x = -\frac{1}{2} + \frac{1}{2} \cdot 10^y$$

Opgave 73:

a. $\frac{1}{2} \cdot 10^{A-3} \neq 5^{A-3}$

b. $\frac{1}{2} \cdot 10^{A-3} = \frac{1}{2} \cdot 10^A \cdot 10^{-3} = 0,0005 \cdot 10^A$

Opgave 74:

a. $N = \log(5P+2)$

$$5P+2 = 10^N$$

$$5P = -2 + 10^N$$

$$P = -\frac{2}{5} + \frac{1}{5} \cdot 10^N$$

b. $F = 5 \log(N) - 8$

$$F + 8 = 5 \log(N)$$

$$\frac{1}{5}F + \frac{8}{5} = \log(N)$$

$$N = 10^{\frac{1}{5}F + \frac{8}{5}}$$

c. $0,5D = \log(4Q + 1) - 2$

$$0,5D + 2 = \log(4Q + 1)$$

$$4Q + 1 = 10^{0,5D+2}$$

$$4Q = -1 + 10^{0,5D+2}$$

$$Q = -\frac{1}{4} + \frac{1}{4} \cdot 10^{0,5D+2}$$

Opgave 75:

a. $A = 2 \log(B) - 4$

$$A + 4 = 2 \log(B)$$

$$\frac{1}{2}A + 2 = \log(B)$$

$$B = 10^{\frac{1}{2}A+2}$$

b. $B = 10^{\frac{1}{2}A+2} = 10^{\frac{1}{2}A} \cdot 10^2 = 100 \cdot 10^{\frac{1}{2}A}$

c. $B = 100 \cdot 10^{\frac{1}{2}A} = 100 \cdot (10^{\frac{1}{2}})^A = 100 \cdot 3,16^A$

Opgave 76:

a. $R = 2 \log(s) - 6$

$$R + 6 = 2 \log(s)$$

$$\frac{1}{2}R + 3 = \log(s)$$

$$s = 10^{\frac{1}{2}R+3} = 10^3 \cdot 10^{\frac{1}{2}R} = 1000 \cdot (10^{\frac{1}{2}})^R = 1000 \cdot 3,16^R$$

b. $5K = 3 \log(N) + 2$

$$5K - 2 = 3 \log(N)$$

$$\frac{5}{3}K - \frac{2}{3} = \log(N)$$

$$N = 10^{\frac{5}{3}K - \frac{2}{3}} = 10^{-\frac{2}{3}} \cdot 10^{\frac{5}{3}K} = 0,22 \cdot (10^{\frac{5}{3}})^K = 0,22 \cdot 46,42^K$$