

SHARP

Werkkaart 9 Memorandum: Algebraïese Vergelykings Kwartaal 1

Graad 9 Wiskunde

1. Let asseblief daarop dat studente die vergelykings effens anders kan skryf, maar die finale antwoorde moet dieselfde wees. As hulle nie is nie, is óf die aanvanklike vergelyking nie korrek nie, óf die uitwerking van die vergelyking is nie korrek gedoen nie.

a) laat George = x dan Sarah = $4x$

$$\therefore x + 4x = 25$$

$$\therefore 5x = 25$$

$$\therefore \frac{5x}{5} = \frac{25}{5}$$

$$\therefore x = 5$$

b) $\frac{x}{8} = 3$

$$\therefore \frac{x}{8} \times 8 = 3 \times 8$$

$$\therefore x = 24$$

c) $73 = b + 31$

$$\therefore 73 - 31 = b + 31 - 31$$

$$\therefore 42 = b$$

d) $5x = 60$

$$\therefore \frac{5x}{5} = \frac{60}{5}$$

$$\therefore x = 12$$

e) $x + \frac{2}{3}x = 600$

$$\therefore \frac{5}{3}x = 600$$

$$\therefore \frac{5}{3}x \times 3 = 600 \times 3$$

$$\therefore 5x = 1800$$

$$\therefore \frac{5x}{5} = \frac{1800}{5}$$

$$\therefore x = 360$$

f) $\frac{42}{x} = 3$

$$\therefore \frac{42}{x} \times x = 3 \times x$$

$$\therefore 42 = 3x$$

$$\therefore \frac{42}{3} = \frac{3x}{3}$$

$$\therefore 14 = x$$

$$g) \quad 36 + x + \frac{3}{4}x = 120$$

$$\therefore 36 - 36 + \frac{7}{4}x = 120 - 36$$

$$\therefore \frac{7}{4}x \times 4 = 84 \times 4$$

$$\therefore \frac{7x}{7} = \frac{336}{7}$$

$$\therefore x = 48$$

$$h) \quad 8x - 5 = 995$$

$$\therefore 8x - 5 + 5 = 995 + 5$$

$$\therefore 8x = 1000$$

$$\therefore \frac{8x}{8} = \frac{1000}{8}$$

$$\therefore x = 125$$

$$i) \quad \text{Laat seuns} = x \text{ en meisies} = 3x$$

$$\therefore x + 3x = 32$$

$$\therefore 4x = 32$$

$$\therefore \frac{4x}{4} = \frac{32}{4}$$

$$\therefore x = 8$$

$$j) \quad \frac{x}{25} = 5$$

$$\therefore \frac{x}{25} \times 25 = 5 \times 25$$

$$\therefore x = 125$$

$$2. \quad a) \quad 3x + 7 = 19$$

$$3x + 7 - 7 = 19 - 7$$

$$3x = 12$$

$$\frac{3x}{3} = \frac{12}{3}$$

$$x = 4$$

$$b) \quad \frac{45}{x} + 2 = 11$$

$$\frac{45}{x} + 2 - 2 = 11 - 2$$

$$\frac{45}{x} = 9$$

$$\frac{45}{x} \times x = 9 \times x$$

$$45 = 9x$$

$$\frac{45}{9} = \frac{9x}{9}$$

$$5 = x$$

$$c) \quad \frac{x}{4} - 5 = 0$$

$$\frac{x}{4} - 5 + 5 = 0 + 5$$

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

$$\frac{x}{4} \times 4 = 5 \times 4$$

$$x = 20$$

$$d) \quad 48 - 3x = 84$$

$$48 - 3x - 48 = 84 - 48$$

$$-3x = 36$$

$$-\frac{3x}{-3} = \frac{36}{-3}$$

$$x = -12$$

$$e) \quad \frac{72}{x} - 12 = 4$$

$$\frac{72}{x} - 12 + 12 = 4 + 12$$

$$\frac{72}{x} = 16$$

$$\frac{72}{x} \times x = 16 \times x$$

$$72 = 16x$$

$$\frac{72}{16} = \frac{16x}{16}$$

$$4\frac{1}{2} = x$$

$$g) \quad 7x - 10 = 3(2x + 12)$$

$$7x - 10 = 6x + 36$$

$$7x - 10 + 10 = 6x + 36 + 10$$

$$7x = 6x + 46$$

$$7x - 6x = 6x - 6x + 46$$

$$x = 46$$

$$i) \quad 3(2 - x) + 4 = 5(x - 7)$$

$$6 - 3x + 4 = 5x - 35$$

$$10 - 3x = 5x - 35$$

$$10 - 3x - 5x - 10 = 5x - 35 - 10 - 5x$$

$$-8x = -45$$

$$-\frac{8x}{-8} = -\frac{45}{-8}$$

$$x = 5\frac{5}{8}$$

$$f) \quad 5(x + 3) = 15$$

$$5x + 15 = 15$$

$$5x + 15 - 15 = 15 - 15$$

$$5x = 0$$

$$\therefore x = 0$$

$$h) \quad \frac{2}{3}x - 4 = 2(x - 3)$$

$$\frac{2}{3}x - 4 = 2x - 6$$

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

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

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

$$-1\frac{1}{3}x = -2$$

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

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

$$j) \quad \frac{x}{-5} + 7 = 1$$

$$\frac{x}{-5} + 7 - 7 = 1 - 7$$

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

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

$$x = 30$$

$$\text{k) } \frac{48}{x} + 10 = 4$$

$$\frac{48}{x} + 10 - 10 = 4 - 10$$

$$\frac{48}{x} = -6$$

$$\frac{48}{x} \times x = -6 \times x$$

$$48 = -6x$$

$$\frac{48}{-6} = \frac{-6x}{-6}$$

$$-8 = x$$

$$\text{m) } \frac{4x+7}{5} = 2$$

$$\frac{4x+7}{5} \times 5 = 2 \times 5$$

$$4x + 7 = 10$$

$$4x + 7 - 7 = 10 - 7$$

$$4x = 3$$

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

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

$$\text{o) } 7(x - 3) + 4 = 5(3 - x)$$

$$7x - 21 + 4 = 15 - 5x$$

$$7x + 5x = 15 + 21 - 4$$

$$12x = 32$$

$$\frac{12x}{12} = \frac{32}{12}$$

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

$$\text{l) } 5(x + 2) = 3(7 - 2x)$$

$$5x + 10 = 21 - 6x$$

$$5x + 10 - 10 + 6x = 21 - 6x - 10$$

$$11x = 11$$

$$\frac{11x}{11} = \frac{11}{11}$$

$$x = 1$$

$$\text{n) } \frac{91}{x+1} - 2 = 5$$

$$\frac{91}{x+1} - 2 + 2 = 5 + 2$$

$$\frac{91}{x+1} = 7$$

$$\frac{91}{x+1} \times (x+1) = 7(x+1)$$

$$91 = 7x + 7$$

$$91 - 7 = 7x$$

$$84 = 7x$$

$$\frac{84}{7} = \frac{7x}{7}$$

$$12 = x$$

$$\text{p) } x^3 + 1 = 9$$

$$x^3 + 1 - 1 = 9 - 1$$

$$x^3 = 8$$

$$x = \sqrt[3]{8}$$

$$x = 2$$

$$q) \quad 5^x - 1 = 124$$

$$5^x - 1 + 1 = 124 + 1$$

$$5^x = 125$$

$$5^x = (5)^3$$

$$x = 3$$

$$r) \quad \frac{1}{2}x + \frac{2}{3}x = 4$$

$$\frac{7}{6}x = 4$$

$$\frac{7}{6}x \div \frac{7}{6} = 4 \div \frac{7}{6}$$

$$x = 3\frac{3}{7}$$

$$s) \quad ax + b = c$$

$$ax + b - b = c - b$$

$$ax = c - b$$

$$\frac{ax}{a} = \frac{c-b}{a}$$

$$x = \frac{c-b}{a}$$

$$t) \quad 120 = 4\pi x^2$$

$$\frac{120}{4\pi} = \frac{4\pi x^2}{4\pi}$$

$$\frac{30}{\pi} = x^2$$

$$x = \sqrt{\frac{30}{\pi}}$$

$$x \approx 3.09$$

3. a) Laat koste vir fliekkaartjie = x

$$\therefore \text{koste van kinders onder 12} = \frac{1}{2}x$$

$$\therefore 4x + 6\left(\frac{1}{2}x\right) = 224$$

$$\therefore 4x + 3x = 224$$

$$\therefore 7x = 224$$

$$\therefore \frac{7x}{7} = \frac{224}{7}$$

$$\therefore x = 32$$

\therefore Elke kaartjie vir Thabang en haar vriende kos R32

b) $Opp = l^2$

$$\therefore 36 = l^2$$

$$\therefore l = \sqrt{36}$$

$$\therefore l = 6$$

$$\text{Omtrek} = 4l$$

$$\therefore P = 4(6)$$

$$\therefore P = 24\text{cm}$$

c) $Volume = lbh$

$$\therefore 252 = 7 \times 9 \times x$$

$$\begin{aligned}\therefore 252 &= 63x \\ &= 1\frac{1}{12} hr\end{aligned}$$

$$\therefore \frac{252}{63} = \frac{63x}{63}$$

$$\therefore x = 4cm$$

d) $Spoed = \frac{afstand}{tyd}$

$$\therefore Spoed = \frac{15+15}{45+20}$$

$$\therefore Spoed = \frac{30}{65min} \quad \text{Maar 65 min}$$

$$\therefore Spoed = \frac{30}{1\frac{1}{12}}$$

$$\therefore \text{Gemiddelde Spoed} = 27.69km/h$$

e) $3x + 4x + 15^\circ + 2x - 30^\circ = 180^\circ$

$$\therefore 9x - 15^\circ = 180^\circ$$

$$\therefore 9x - 15^\circ + 15^\circ = 180^\circ + 15^\circ$$

$$\therefore 9x = 195^\circ$$

$$\therefore \frac{9x}{9} = \frac{195^\circ}{9}$$

$$\therefore x = 21\frac{2}{3}^\circ \text{ of } 21.67^\circ$$