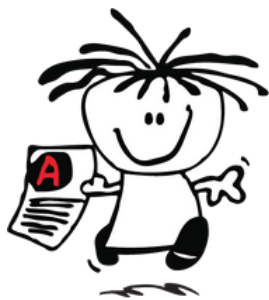


A Senior Phase Problem Solving WORKSHOP

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Gr 8 & 9 SOLUTIONS

GAUTENG
August 2025



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Topic 1 Whole Numbers

p8, Ex 1.7

Solution on pA12

4.3 The cost price and sale price is equal on a break-even sale.

$\therefore$ Jacob paid R180 for the item he purchased.

$\therefore$ Original price $\times 0,6 = 180$

$\therefore$ Original price $= 180 \div 0,6 = \text{R}300$



Topic 1 Whole Numbers

p12, Ex 1.13

Solution on pA17

16. ✗ $(2)(2)(2) \times (2)(2)(2) = 8 \times 8 = 64$
but $64 < 100$

✓ $(3)(3)(3) \times (3)(3)(3) = 27 \times 27 = 729$
and $100 < 729 < 1\,000$

this can also be written as

$$(3)(3) \times (3)(3) \times (3)(3) = 9 \times 9 \times 9 = 729$$

OR

List the square numbers between 100 and 1 000,
calculating the cube root each time:

121 ; 144 ; 169 ; 196 ; 225 ; 256 ; 289 ; 324 ;
361 ; 400 ; 441 ; 484 ; 529 ; 576 ; 625 ; 676 ; **729**

$$\therefore \sqrt[3]{729} = 9 \text{ and } 9 \text{ is a perfect square.}$$

$\therefore$ Todd's bike combination lock is 729.



Topic 16 Area & Perimeter of 2D Shapes

p53, Ex 16.2

Solution on pA69

10. $EH = x \quad \therefore EF = 2x$

$EH = FG = x \quad \dots \text{ opp. sides of a parallelogram}$

$EF = HG = 2x \quad \dots \text{ opp. sides of a parallelogram}$

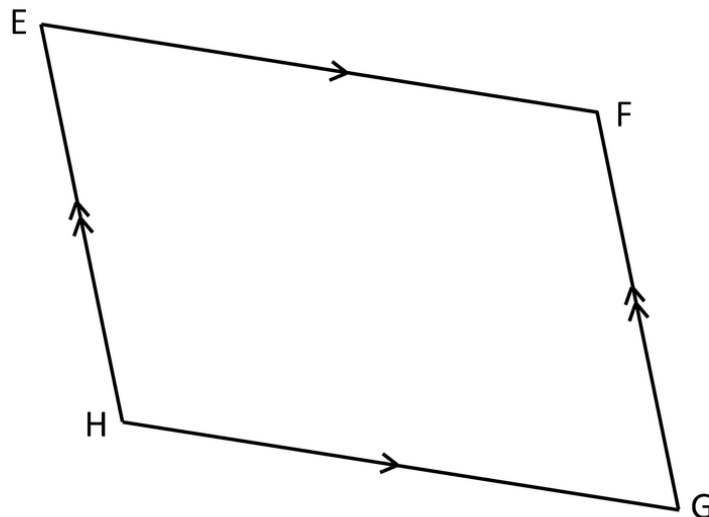
$\therefore \text{Perimeter} = x + 2x + x + 2x = 30 \text{ cm}$

$\therefore 6x = 30 \text{ cm}$

$\therefore \frac{6x}{6} = \frac{30 \text{ cm}}{6}$

$\therefore x = 5 \text{ cm}$

$\therefore FG = 5 \text{ cm}$



Topic 16

Algebraic Equations (Part 2)

p68, Ex 20.2

Solution on pA87

8. There are 10 questions

Let the number of correct questions be x ; then
the number of incorrect questions will be $10 - x$

$$\therefore 5x + (-3)(10 - x) = 26$$

$$\therefore 5x - 3(10 - x) = 26$$

$$\therefore 5x - 30 + 3x = 26$$

$$\therefore 8x - 30 = 26$$

$$\therefore 8x - 30 + \mathbf{30} = 26 + \mathbf{30}$$

$$\therefore 8x = 56$$

$$\frac{8x}{\mathbf{8}} = \frac{56}{\mathbf{8}}$$

$$\therefore x = 7$$

$\therefore$ Menzi got **7 answers** correct.

GR 9 MATHS 2-IN-1

Topic 5 Numeric & Geometric Patterns

p18, Ex 5.2

Solution on pA22

$$\begin{array}{l} \text{6.1} \quad \text{Value of } \text{📖} = 2 \\ \text{Value of } \text{☯} = 3 \end{array} \left. \vphantom{\begin{array}{l} \text{Value of } \text{📖} = 2 \\ \text{Value of } \text{☯} = 3 \end{array}} \right\} \dots \text{from row 1 \& 4}$$

$$\therefore \text{Value of } \text{💻} = 1 \quad \dots \text{from column 1, 3 or 4}$$

$$\therefore \text{Value of } \text{☎} = 8 \quad \dots \text{from row 3}$$

$$\begin{aligned} \therefore \text{Total for 2}^{\text{nd}} \text{ row} &= 2 + 8 + 2 + 1 \\ &= 13 \end{aligned}$$



$$\begin{aligned} \text{6.2} \quad \text{The sum of the horizontal totals} &= 11 + 13 + 11 + 9 \\ &= 44 \end{aligned}$$

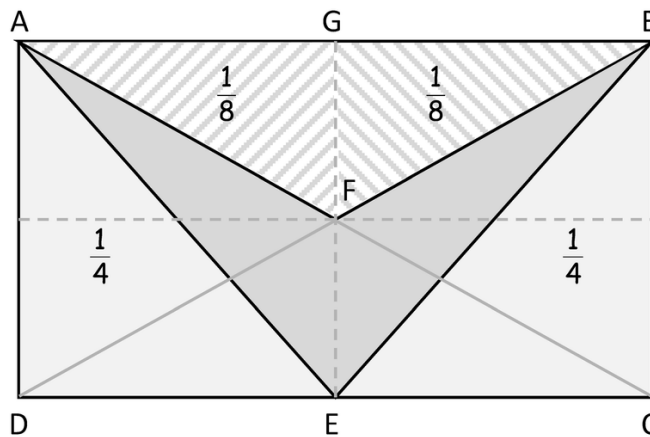
$$\begin{aligned} \therefore \text{The total for the second column} &= 44 - (8 + 8 + 7) \\ &= 21 \end{aligned}$$

Topic 13 Perimeter & Area of 2D Shapes

p49, Ex 13.3

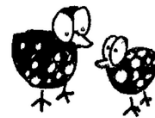
Solution on pA59

16. Divide the rectangle up and see what fraction of the area is unshaded.



$\triangle ADE$ is $\frac{1}{4}$ of ABCD

$\triangle BCE$ is $\frac{1}{4}$ of ABCD



$\triangle AGF$ is $\frac{1}{2}$ of the top left quarter of ABCD

$\therefore \frac{1}{8}$ of ABCD

$\triangle GFB$ is $\frac{1}{2}$ of the top right quarter of ABCD

$\therefore \frac{1}{8}$ of ABCD

$$\therefore \frac{1}{4} + \frac{1}{4} + \frac{1}{8} + \frac{1}{8}$$

$$= \frac{2+2+1+1}{8}$$

$$= \frac{6}{8}$$

$$= \frac{3}{4} \text{ unshaded}$$



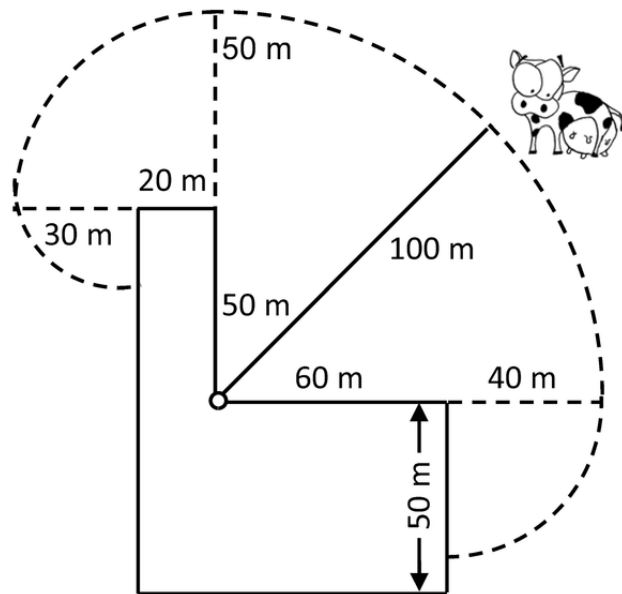
$\therefore$ The $\frac{1}{4}$ that is left over is the shaded area

Topic 13 Perimeter & Area of 2D Shapes

p49, Ex 13.3

Solution on pA59

17.



$$\begin{aligned}
 & \frac{1}{4} \text{ of a circle with } r = 100 \text{ m} \\
 & + \frac{1}{4} \text{ of a circle with } r = 50 \text{ m} \\
 & + \frac{1}{4} \text{ of a circle with } r = 30 \text{ m} \\
 & + \frac{1}{4} \text{ of a circle with } r = 40 \text{ m}
 \end{aligned}$$

Grazing area

$$\begin{aligned}
 & = \frac{1}{4} \pi (100)^2 + \frac{1}{4} \pi (50)^2 + \frac{1}{4} \pi (30)^2 + \frac{1}{4} \pi (40)^2 \\
 & = 11\,780,97 \text{ m}^2
 \end{aligned}$$

Topic 16

Algebraic Equations (Part 2)

p54, Ex 16.3

Solution on pA68

$$\begin{aligned} 21.1 \quad \text{Total distance} &= (2x^2 - 1) + (x^2 + 2) + (x^2 - 3) \\ &= 2x^2 - 1 + x^2 + 2 + x^2 - 3 \\ &= 4x^2 - 2 \end{aligned}$$

$$\therefore 4x^2 - 2 = 23$$

$$\therefore 4x^2 - 25 = 0$$

$$\therefore (2x + 5)(2x - 5) = 0$$

$$\therefore x = -\frac{5}{2} \quad \text{or} \quad x = \frac{5}{2}$$

OR

$$\begin{aligned} 4x^2 &= 25 \\ \therefore x^2 &= \frac{25}{4} \\ \therefore x &= \pm \frac{5}{2} \end{aligned}$$

It is important in questions regarding dimensions to check whether all the dimensions are positive as a result of the solution(s) of x .

21.2 Church to House B

$$= x^2 + 2 + x^2 - 3$$

$$= 2x^2 - 1$$

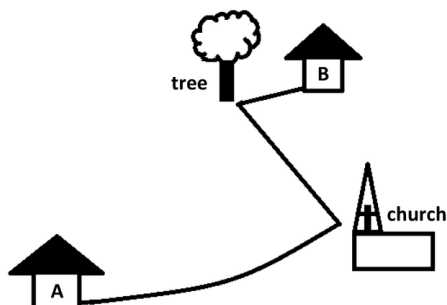
$$= 2\left(\frac{5}{2}\right)^2 - 1$$

$$= 2\left(\frac{25}{4}\right) - 1$$

$$= \frac{25}{2} - 1$$

$$= \frac{23}{2}$$

$$= 11,5 \text{ km}$$



21.3 From House B:

Speed = 60 km/h and distance = 11,5 km

$$\therefore \text{time} = \frac{\text{distance}}{\text{speed}}$$

$$= \frac{11,5}{60}$$

$$= 0,19166... \text{ hours}$$

OR

$$\begin{aligned} &\div 60 \left(\begin{array}{l} 60 \text{ km} : 1 \text{ hour} \\ 1 \text{ km} : \end{array} \right) \div 60 \\ &\times 11,5 \left(\begin{array}{l} 11,5 \text{ km} : 0,1916... \end{array} \right) \times 11,5 \end{aligned}$$

$$\therefore \text{Time from House A} = 6(0,19166...)$$

$$= 1,15 \text{ h}$$

$$= 1 \text{ h } 9 \text{ min}$$

$$\frac{15}{100} \text{ of } 1 \text{ hour}$$

$$\therefore \frac{15}{100} \times 60 = 9 \text{ min}$$

$$08\text{h}05 + 1\text{h}09$$

$$= 09\text{h}14$$

$\therefore$ He will get to church at 09h14.

OR

60 km/h is 1 km/min

$\therefore$ 11,5 km will take 11,5 minutes

$$\begin{aligned} \therefore \text{Time from House A} &= 6(11,5) \\ &= 69 \text{ minutes} \end{aligned}$$

$$08\text{h}05 + 69 \text{ min} = 09\text{h}14$$

$\therefore$ He will get to church at 09h14



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