

For questions 1 to 5 write the letter which corresponds your answer.

1. The distance of the earth from the sun is approximately 1 50 000 000 km. What is this distance in standard form?

A  $1.5 \times 10^5 \text{km}$

B  $1.5 \times 10^6 \text{km}$

C  $1.5 \times 10^7 \text{km}$

D  $1.5 \times 10^8 \text{km}$

2. A woman's basic rate of pay is \$12 per hour for a 40 hour week. Overtime is paid at the rate of time-and-a-half. What is the woman's weekly wage if she worked 46 hours in that particular week?

A \$552

B \$480

C \$660

D \$588

3. If  $2(3 - y) \leq 4y - 12$ , then

A  $y \geq 3$

B  $y \geq 1$

C  $y \leq -3$

D  $y \geq -1$

4. Given that  $U = \{a, b, c, d, e, f\}$ ,  $A = \{a, b, c\}$ ,  $B = \{b, c, d, e\}$ , what is  $A' \cap B$ ?

A  $\{f\}$

B  $\{d, e, f\}$

C  $\{d, e\}$

D  $\{d\}$

5. If  $\frac{x-1}{3} + 2 = \frac{x+5}{4}$ , then the value of  $x$  is

A 8

B 3

C -5

D -30

[5]

6. Find the value of the following, giving your answers in standard form:

a)  $6.12 \times 10^3 + 3.995 \times 10^2$  [4]

b)  $(3.5 \times 10^{-3}) \div (7 \times 10^{-5})$  [3]

a)  $6120 + 399.5 = 6519.5 = 6.5195 \times 10^3$

b)  $\frac{0.0035}{0.00007} = 50 = 5.0 \times 10^1$

7. A large map of a certain country hangs on the wall of a room. The scale on the map is 1:10 000.

a) What is the actual distance, in metres, between two villages that are 2 cm apart? [2]

b) The actual distance between two towns is 14 km. What is the distance on the map that represents this? [2]

a)  $\begin{array}{cc} \text{cm} & \text{cm} \\ 1 & : 10\ 000 \end{array}$

$\begin{array}{cc} \times 2 & \times 2 \\ \hline \end{array}$

$2\text{ cm} \quad 20000\text{ cm} = 200\text{ m}$

b)  $\begin{array}{ccc} \text{cm} & \text{cm} & \text{km} \\ 1 & : 10\ 000 & : 0.1 \end{array}$

$\times 140$

$140\text{ cm}$

$\times 140$

$14\text{ km}$

8. Mr. Ward earned \$300 in simple interest when he invested \$4 000 for 3 years in a savings account with The National Bank of Bim. What is the bank's annual rate of interest? [2]

$$I = \$300$$

$$\$4000 \times \frac{R}{100} \times 3 = \$300$$

$$P = \$4000$$

$$t = 3$$

$$\$120 R = \$300$$

$$R = ?$$

$$R = \frac{300}{120} = 2.5$$

9. Remove the brackets and simplify:

a)  $3(x + y) + 2(x - y)$

[3]

b)  $x(2y - 3z) - y(4x - 5z)$

[4]

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

$$\begin{aligned} \text{b) } & x(2y - 3z) - y(4x - 5z) \\ & = 2xy - 3xz - 4xy + 5yz \\ & = -2xy - 3xz + 5yz \end{aligned}$$

10. Solve the following equations:

a)  $3(x - 3) + 5 = 8 - x$

[2]

b)  $\frac{x}{3} + \frac{x}{5} = 2$

[3]

a)  $3(x - 3) + 5 = 8 - x$

$$3x - 9 + 5 = 8 - x$$

$$3x - 4 = 8 - x$$

$$4x = 12$$

$$x = 3$$

b)  $\frac{x}{3} + \frac{x}{5} = 2 \quad \times 15$

$$5x + 3x = 30$$

$$8x = 30$$

$$x = \frac{30}{8}$$

$$x = \frac{15}{4}$$

11. Make  $x$  the subject of the following equations:

a)  $4y = 27 + 3x$  [2]

b)  $12a + 3xb = 14q$  [2]

c)  $Z = A(3x + 2y)$  [3]

a)  $4y = 27 + 3x$

$$4y - 27 = 3x$$

$$\frac{4y - 27}{3} = x$$

b)  $12a + 3xb = 14q$

$$3xb = 14q - 12a$$

$$x = \frac{14q - 12a}{3b}$$

c)  $Z = A(3x + 2y)$

$$Z = 3Ax + 2Ay$$

$$Z - 2Ay = 3Ax$$

$$\frac{Z - 2Ay}{3A} = x$$

12. Write down the 7<sup>th</sup> and 8<sup>th</sup> terms in the following sequences.

a) 1, 4, 9, 16, ... 49, 64 [2]

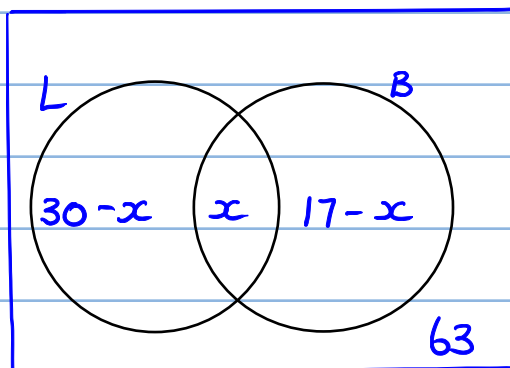
b)  $\frac{1}{8}, \frac{1}{4}, \frac{1}{2}, 1, \dots$  , 8, 16 [2]

13. In a check of 100 vehicles, the police found that 30 vehicles had defective lights, 17 had defective brakes and 63 had no defect at all.

Letting  $x$  represent the number of vehicles with both defective lights and defective brakes,

- a) Draw a Venn diagram to represent this information. [5]
- b) Calculate the value of  $x$ . [2]
- c) Determine the number of vehicles with only faulty lights. [1]

a)



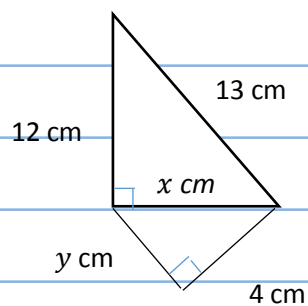
$$b) 30 - x + x + 17 - x + 63 = 100$$

$$110 - x = 100$$

$$10 = x$$

$$c) 30 - x = 30 - 10 = 20$$

14. Find the values of  $x$  and  $y$  in the diagram below.



[3]

By Pythagoras' Theorem

$$12^2 + x^2 = 13^2$$

$$144 + x^2 = 169$$

$$x^2 = 169 - 144$$

$$x^2 = 25$$

$$x = 5$$

$$y^2 + 4^2 = 5^2$$

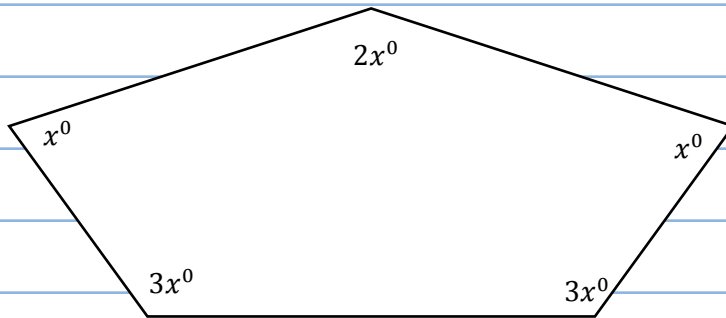
$$y^2 + 16 = 25$$

$$y^2 = 25 - 16$$

$$y^2 = 9$$

$$y = 3$$

15. The interior angles of a pentagon are  $x^\circ$ ,  $x^\circ$ ,  $2x^\circ$ ,  $3x^\circ$  and  $3x^\circ$ . Calculate the value of  $x$ . [3]



Sum of angles in pentagon =  $540^\circ$

$$x + x + 2x + 3x + 3x = 540$$

$$10x = 540$$

$$x = 54$$



16. Using a ruler, a pencil and a pair of compasses, construct a triangle  $PQR$  in which  $PQ = 8\text{cm}$ ,  $PR = 6\text{cm}$  and angle  $P = 60^\circ$ . [3]

Measure and state i) the length of  $RQ$  [1]

ii) the size of the angle at  $Q$ . [1]

