

List of formulas

Area, A , of triangle, base b , height h .

$$A = \frac{1}{2}bh$$

Area, A , of circle of radius r .

$$A = \pi r^2$$

Circumference, C , of circle of radius r .

$$C = 2\pi r$$

Curved surface area, A , of cylinder of radius r , height h .

$$A = 2\pi rh$$

Curved surface area, A , of cone of radius r , sloping edge l .

$$A = \pi rl$$

Surface area, A , of sphere of radius r .

$$A = 4\pi r^2$$

Volume, V , of prism, cross-sectional area A , length l .

$$V = Al$$

Volume, V , of pyramid, base area A , height h .

$$V = \frac{1}{3}Ah$$

Volume, V , of cylinder of radius r , height h .

$$V = \pi r^2 h$$

Volume, V , of cone of radius r , height h .

$$V = \frac{1}{3}\pi r^2 h$$

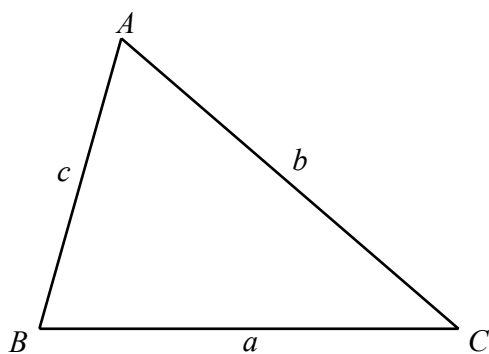
Volume, V , of sphere of radius r .

$$V = \frac{4}{3}\pi r^3$$

For the equation $ax^2 + bx + c = 0$, where $a \neq 0$,

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

For the triangle shown,



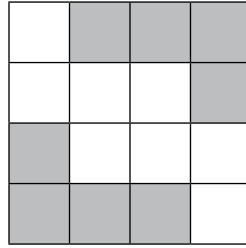
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Area} = \frac{1}{2}ab \sin C$$

Calculators must **not** be used in this paper.

1



Write down the order of rotational symmetry of the diagram.

..... [1]

- 2 At noon the temperature in Maseru was 21°C .
At midnight the temperature had fallen by 26°C .

Work out the temperature at midnight.

..... $^{\circ}\text{C}$ [1]

- 3 Work out.

(a) 0.3×0.07

..... [1]

(b) $8 \div 0.2$

..... [1]

- 4 Write down

(a) a square number greater than 10

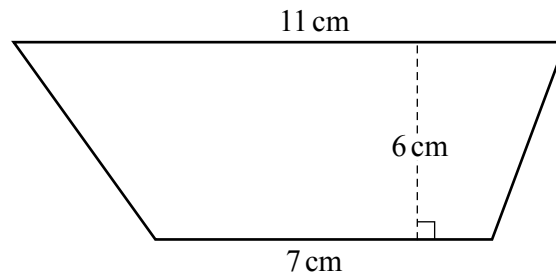
..... [1]

(b) the reciprocal of 20.

..... [1]

4

5

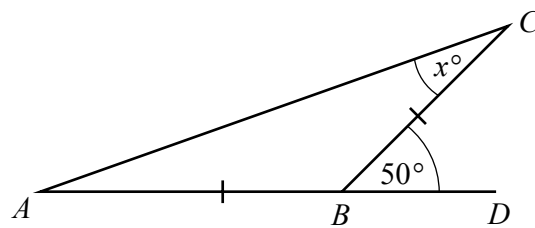


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Work out the area of the trapezium.

.....cm² [2]

6



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$AB = BC$ and ABD is a straight line.

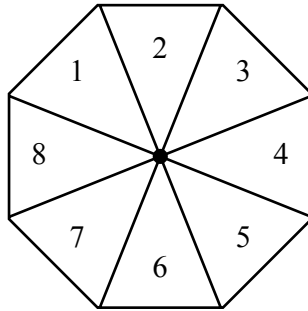
Find the value of x .

$x =$ [2]

7 Write 0.00067 in standard form.

..... [1]

- 8 Jude has a fair 8-sided spinner numbered 1 to 8.



- (a) Jude spins the spinner once.

Find the probability that the spinner lands on

- (i) a number greater than 6

..... [1]

- (ii) an even number or a multiple of 7.

..... [1]

- (b) Jude spins the spinner 240 times.

Work out the expected number of times the spinner lands on a number greater than 6.

..... [1]

- 9** Using a ruler and pair of compasses only, construct a rhombus with side length 6 cm and a diagonal of length 9.5 cm.

One side has been drawn for you.



[3]

- 10** The time that Rafiq works is divided into meetings, planning and working on a computer.

One day, Rafiq is

- in meetings for $\frac{3}{4}$ of the time
- planning for $\frac{1}{5}$ of the time
- working on a computer for the remaining 25 minutes of the time.

Work out the total time that Rafiq works this day.

Give your answer in hours and minutes.

..... hours minutes [5]

11 (a) Expand.

$$2x(3x^2 - 8x)$$

..... [2]

(b) (i) Factorise.

$$x^2 - 19^2$$

..... [1]

(ii) Work out.

$$81^2 - 19^2$$

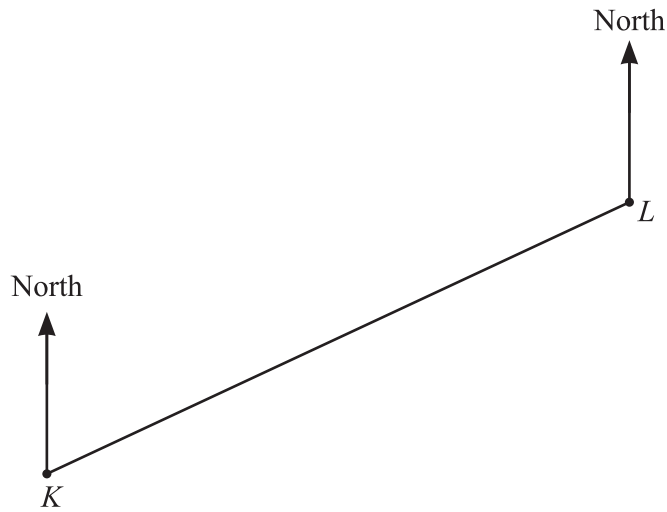
..... [2]

(c) Factorise.

$$3x(a + 4y) - ay - 4y^2$$

..... [2]

- 12** The scale drawing shows the positions of town K and town L .
The scale is 1 cm represents 10 km.



Scale : 1 cm to 10 km

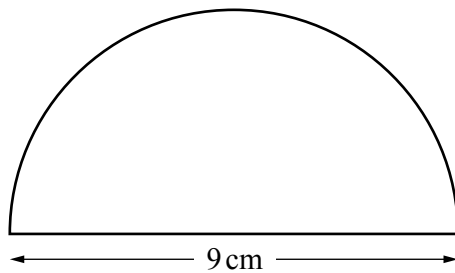
- (a)** Find the actual distance between town K and town L .

..... km [2]

- (b)** Measure the bearing of town L from town K .

..... [1]

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The diagram shows a semicircle with diameter 9 cm.

Calculate the total perimeter of this semicircle.
Give your answer in exact form.

..... cm [3]

- 14** Point A has coordinates $(-4, 1)$ and $\overrightarrow{BA} = \begin{pmatrix} -5 \\ -12 \end{pmatrix}$.

(a) Find the coordinates of point B .

(..... ,) [2]

(b) Point C has coordinates $(5, -2)$.

Find the vector $\overrightarrow{CA}$.

$\overrightarrow{CA} = \begin{pmatrix} \\ \end{pmatrix}$ [2]

(c) $\overrightarrow{EF} = 3\overrightarrow{BA}$

Find $|\overrightarrow{EF}|$.

..... [3]

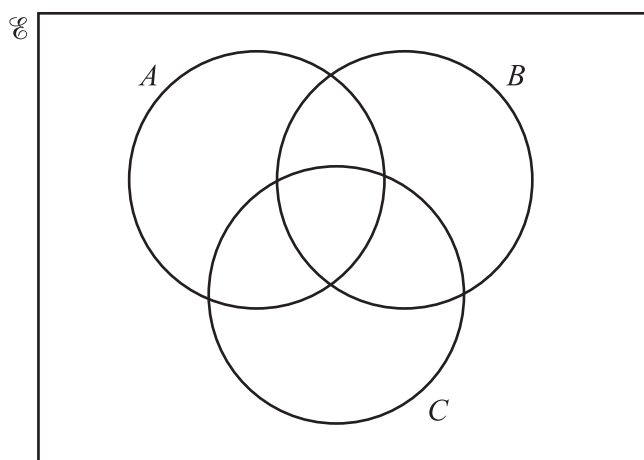
15 Work out.

$$\frac{2}{5} + 0.3\dot{7}$$

Give your answer as a fraction in its simplest form.

..... [4]

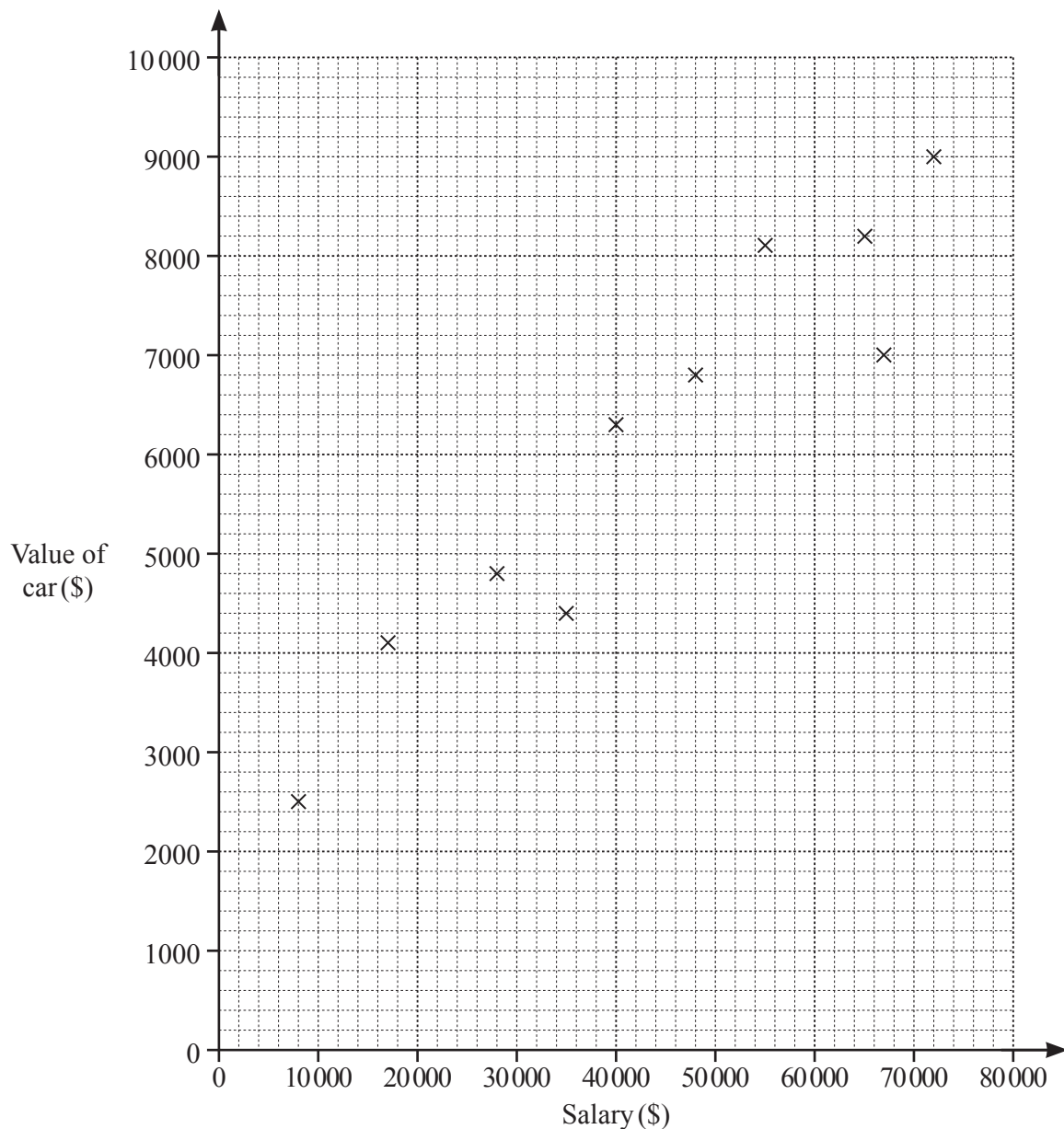
16



In the Venn diagram, shade the region $(A \cup B \cup C)'$.

[1]

- 17 For each of 10 people working in an office, the scatter diagram shows their salary and the value of their car.



- (a) One of these people has a salary of \$28 000.

Find the value of their car.

\$ [1]

- (b) Another person starts to work in the office.
Their salary is \$54 000 and the value of their car is \$6100.

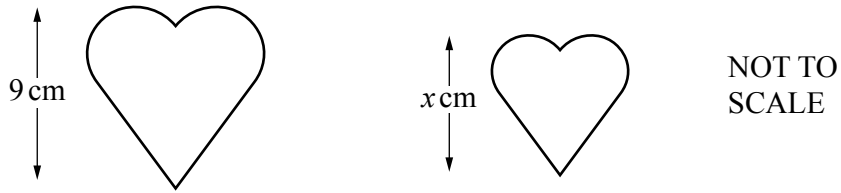
Plot this information on the scatter diagram.

[1]

- (c) What type of correlation is shown in the scatter diagram?

..... [1]

18



The two shapes are mathematically similar.

The area of the larger shape is 36 cm^2 and the area of the smaller shape is 25 cm^2 .

The height of the larger shape is 9 cm and the height of the smaller shape is $x \text{ cm}$.

Find the value of x .

$x = \dots\dots\dots$ [3]

19 (a) Simplify.

$$\sqrt{300} + \sqrt{48}$$

$\dots\dots\dots$ [2]

(b) Rationalise the denominator and simplify.

$$\frac{9}{2 + \sqrt{7}}$$

$\dots\dots\dots$ [3]

- 20 (a)** Write down the coordinates of the point where the graph of $y = 5x - 3$ crosses the y -axis.

(..... ,) [1]

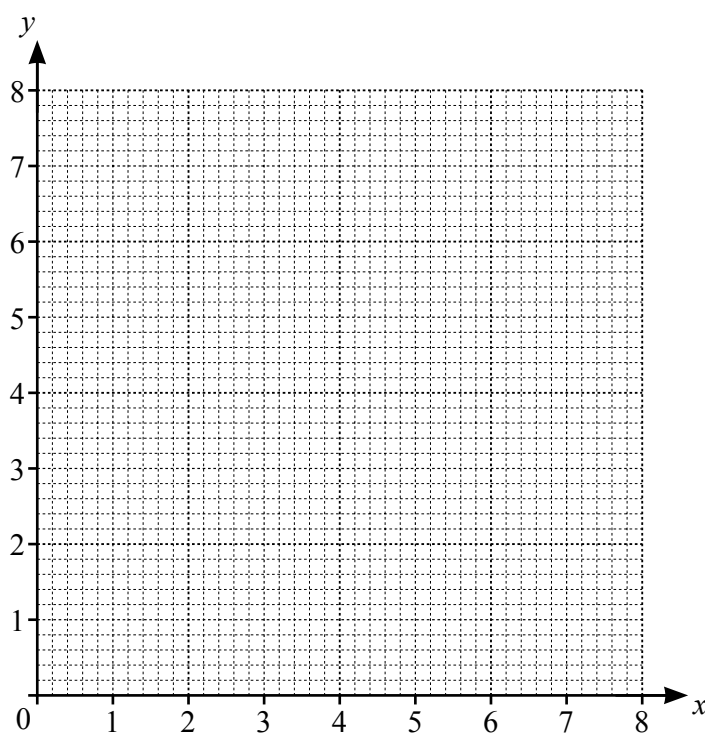
- (b)** A is the point $(1, 7)$ and B is the point $(5, 15)$.

Find the equation of the perpendicular bisector of the line AB .

Give your answer in the form $y = mx + c$.

$y =$ [5]

21



(a) By drawing suitable lines and shading the unwanted regions, find the region, R , where

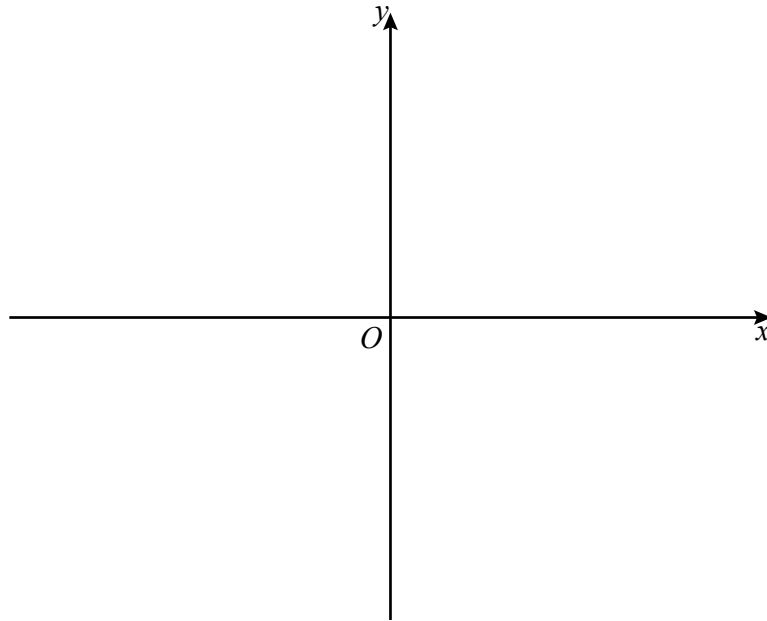
$$x \geq 2, \quad y \geq x \quad \text{and} \quad 2x + y \leq 8.$$

[5]

- 22 (a) (i) Write $x^2 - 8x + 10$ in the form $(x - a)^2 - b$.

..... [2]

- (ii) Sketch the graph of $y = x^2 - 8x + 10$.
On the sketch, label the coordinates of the turning point and the y-intercept.



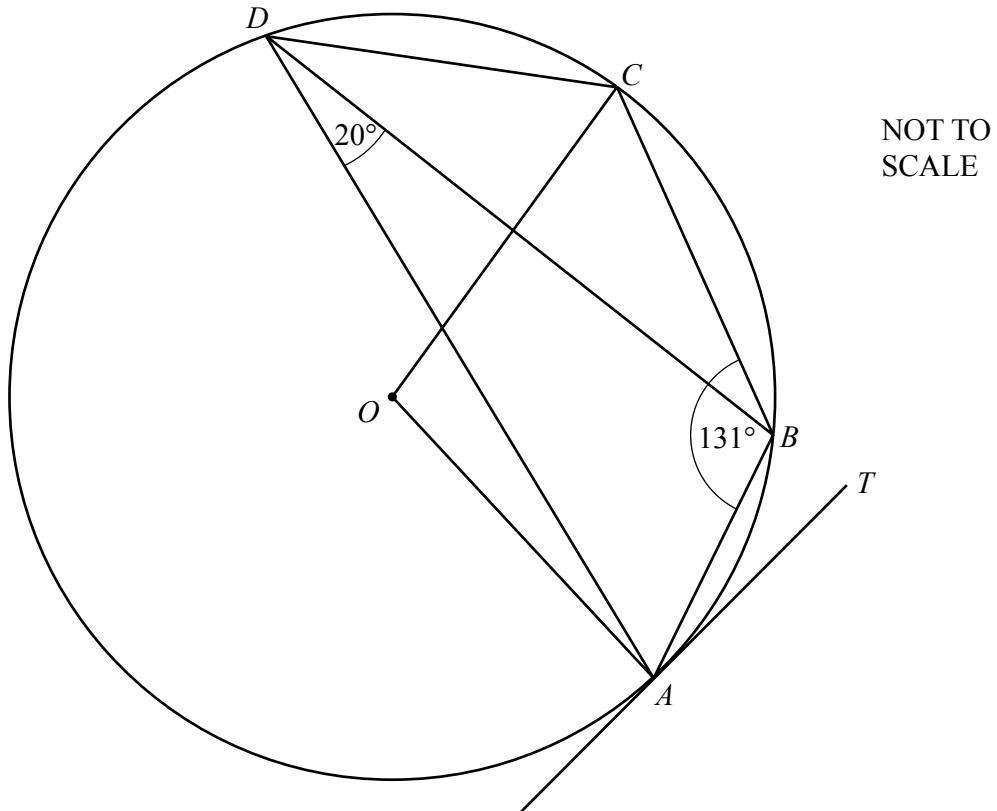
[3]

- (b) A point P lies on the graph of $y = x^2 - 8x + 10$.
The gradient of the graph at P is 6.

Find the coordinates of P .

(..... ,) [4]

23



A, B, C and D lie on the circle, centre O .
 TA is a tangent to the circle at A .
 Angle $ABC = 131^\circ$ and angle $ADB = 20^\circ$.

Find

(a) angle ADC

Angle $ADC = \dots\dots\dots$ [1]

(b) angle AOC

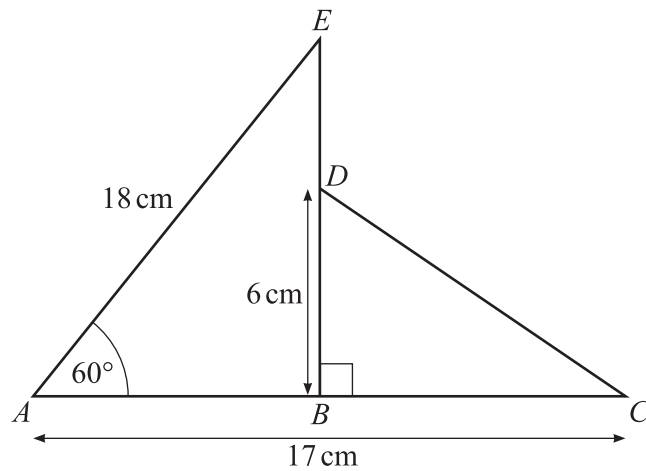
Angle $AOC = \dots\dots\dots$ [1]

(c) angle BAT

Angle $BAT = \dots\dots\dots$ [1]

(d) angle OAB .

Angle $OAB = \dots\dots\dots$ [1]

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The quadrilateral $ACDE$ is formed by two right-angled triangles ABE and BCD .
 $AC = 17$ cm, $AE = 18$ cm and $BD = 6$ cm.

(a) Show that $CD = 10$ cm.

[5]

(b) Find the perimeter of the quadrilateral $ACDE$.
 Give your answer in the form $p + k\sqrt{q}$.

..... cm [4]

25 Solve $2\sin x - 1 = 0$ for $0^\circ \leq x \leq 360^\circ$

$x = \dots\dots\dots$ or $x = \dots\dots\dots$ [3]

26 (a) Simplify $\left(\frac{x^2}{4}\right)^{\frac{3}{2}}$.

$\dots\dots\dots$ [2]

(b) $16^x \times \left(\frac{1}{2}\right)^x = 4^{x+3}$

Find the value of x .

$x = \dots\dots\dots$ [4]