Mathematical Formulae

Compound Interest

$$\text{Total amount} = P\left(1+\frac{r}{100}\right)^n$$

Quadratic Equation $ax^2+bx+c=0$

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

Geometry and Measurement

Curved surface area of a cone = πrl

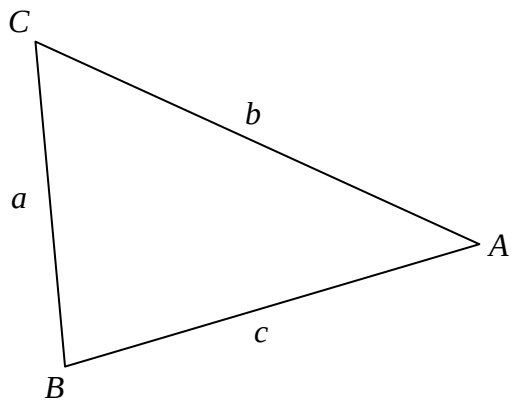
Surface area of a sphere = $4\pi r^2$

Volume of a cone = $\frac{1}{3}\pi r^2 h$

Volume of a pyramid = $\frac{1}{3}\times \text{base area} \times \text{height}$

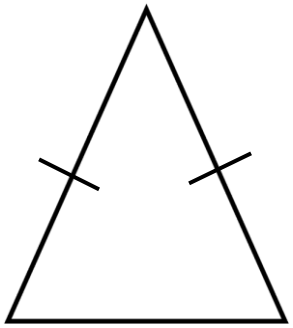
Volume of a sphere = $\frac{4}{3}\pi r^3$

Area of triangle ABC = $\frac{1}{2}ab\sin C$



Answer **all** the questions.

1



Write down

(a) the order of rotational symmetry,

Answer (a) ..... [1]

(b) the number of lines of symmetry.

Answer (b) ..... [1]

2 Write the following numbers in order, starting with the largest.

$\sqrt{0.1975}$ 4.4% 44.445×10^{-2} $0.\dot{4}$

Answer ..... largest , ... , ... , ... smallest [2]

3 A SBS bus travels a distance of 2250 metres from the bus interchange to the first stop in 7.5 minutes.

Calculate the speed of the bus in metres per second.

Answer ..... m/s [2]

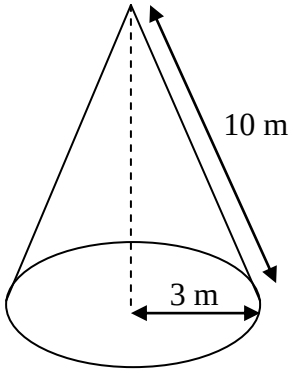
4 Solve the simultaneous equations

$3x + 5y = 50$,

$x - 2y = -9$.

Answer $x =$ ..... $y =$ ..... [3]

5 The exterior curved surface of a conical oil storage tank was painted orange. One tin of orange paint can cover 7 square metres. Calculate how many tins of paint were bought to paint the tank.



Answer ..... tins [3]

6 8 AMKsians took 24 days to build a structure for NOMAD. Assuming each of them works at the same rate, how many more AMKsians are needed to build the structure if it is to be completed within 16 days?

Answer ..... AMKsians [2]

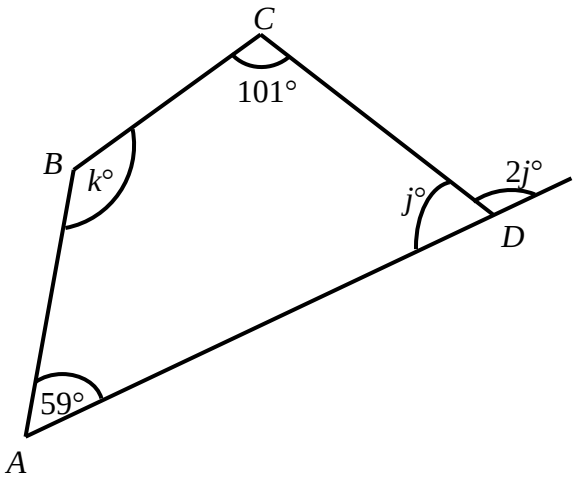
7 Solve $\frac{3y-1}{2}+\frac{2y-3}{3}=4$.

Answer $y =$ ..... [3]

8 The quadrilateral *ABCD* has angles as shown in the diagram. Find the values of

(a) j,

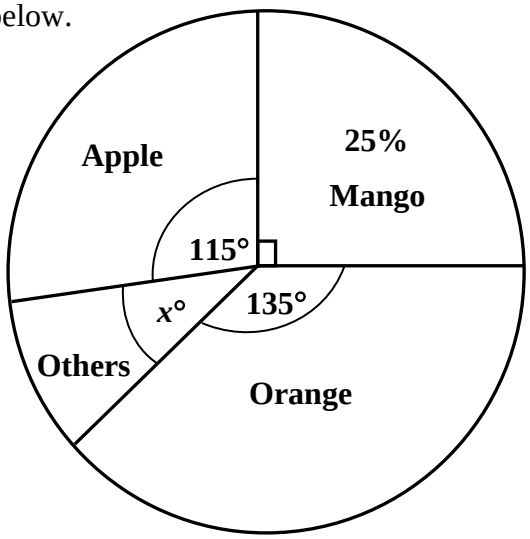
(b) k.



Answer (a) $j =$ ..... ° [2]

(b) $k =$ ..... ° [2]

9 Students from a secondary school were asked to vote for their favourite fruit juices. The results are shown on the given pie chart below.



Calculate

(i) the value of x,

(ii) the percentage of students who voted for orange juice.

Answer (i) ..... ° [1]

(ii) ..... % [2]

10 During an electronic fair, Andy wanted to purchase a laptop. He could pay $270 as down payment and 36 monthly instalments of $70 or pay the cash price of $2600.

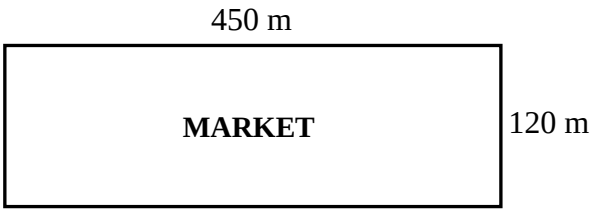
(a) How much would the laptop cost if Andy paid by instalment?

Answer (a) $ ..... [2]

(b) How much would Andy save if he paid the cash price?

Answer (b) $ ..... [1]

11 A map of Sunshine New Town is drawn to a scale of 5 : 30 000. The actual dimensions of a market in the town are shown below.



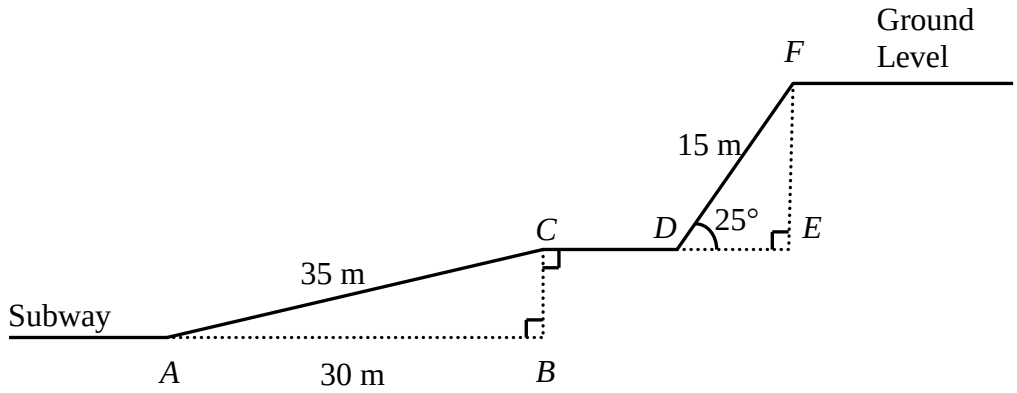
(a) What is the length (L) and breadth (B) of the market on the map?

Answer (a) L = ... cm B = ... cm [3]

(b) The area of a bus interchange on the map is 30 cm^2.
What is the actual area in km^2 ?

Answer (b) ..... km^2 [2]

12 The diagram below shows a ramp AC, and an escalator DF, that are used to get from a subway to ground level. Given that $AB = 30$ m, $AC = 35$ m, $DF = 15$ m, $\angle ABC = \angle DEF = 90°$ and $\angle FDE = 25°$, calculate



(a) the height BC,

Answer (a) ..... m [2]

(b) the height EF,

Answer (b) ..... m [2]

(c) $\angle BAC$.

Answer (c) ..... ° [2]

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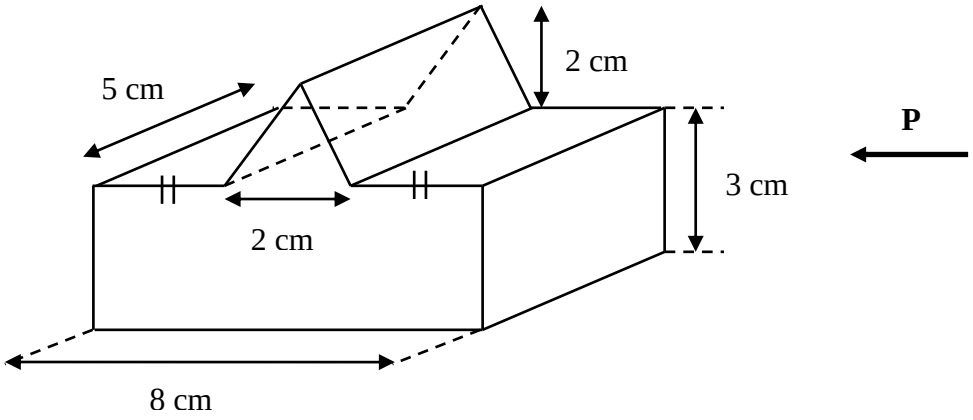

The diagram shows a prism.

(a) Draw an **accurate** side elevation (direction **P**). [3]

(b) Calculate the volume of the prism.

Answer (b) ..... cm^3 [3]

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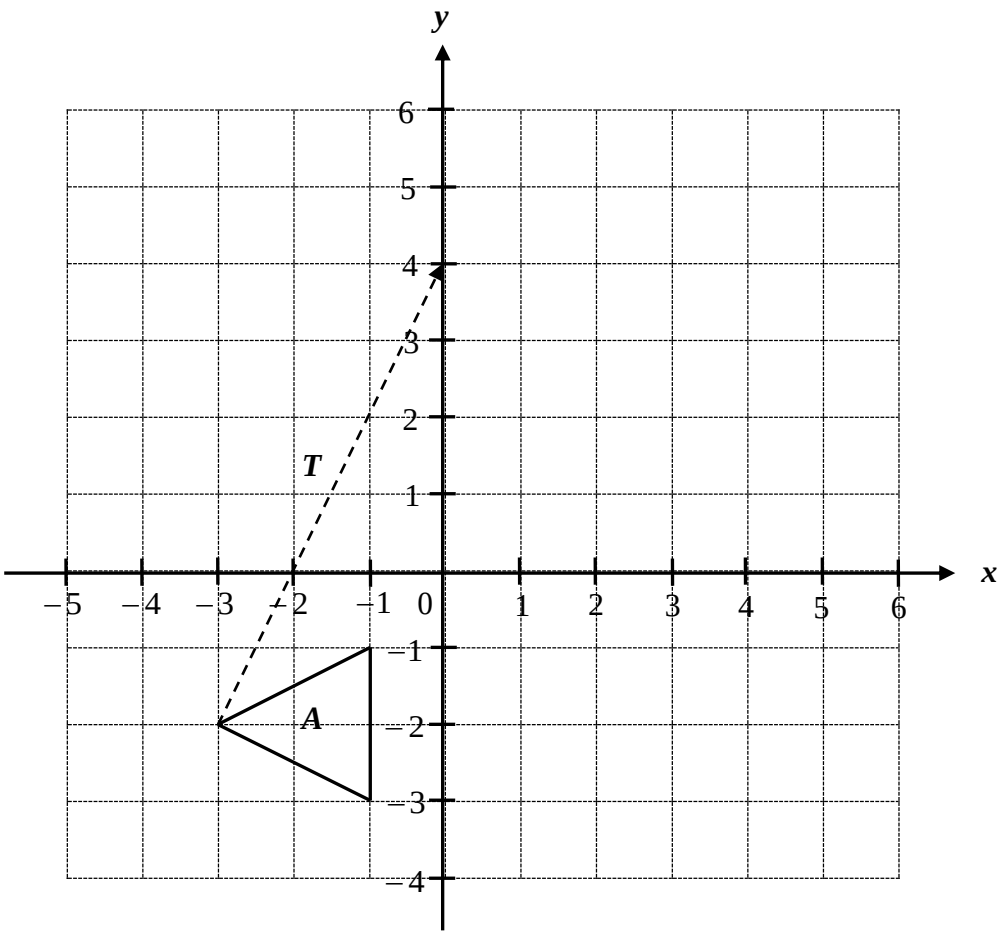

Triangle *A* is shown on the grid.

(a) On the grid, draw accurately the image of triangle *A* under the translation, T. Label the image *X*. [2]

(b) Draw accurately the image of triangle *A* under the following transformations.

(i) A reflection in the line $x = 1$. Label the image *Y*. [2]

(ii) A 180° clockwise rotation about the origin, *O*. Label the image *Z*. [2]

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