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0580/22

October/November 2017

1 hour 30 minutes

Additional Materials: Electronic calculator Geometrical instruments
Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

DO **NOT** WRITE IN ANY BARCODES.

For π , use either your calculator value or 3.142.

The total of the marks for this paper is 70.

This document consists of **11** printed pages and **1** blank page.

- 1 One day, at noon, in Maseru, the temperature was 17°C .
At midnight the temperature was 20°C lower.

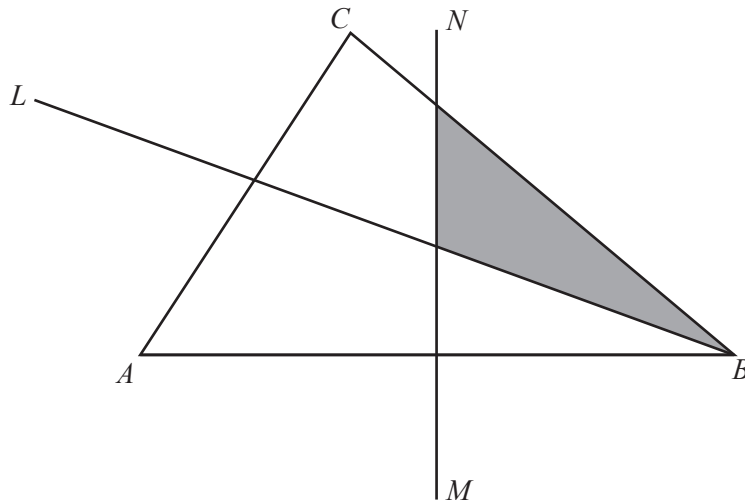
Work out the temperature at midnight.

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

- 2 Write 5.17×10^{-3} as an ordinary number.

..... [1]

3



In the diagram, BL is the bisector of angle ABC and MN is the perpendicular bisector of AB .

Complete the statement.

The shaded region contains the points, inside triangle ABC , that are

- nearer to B than to A
- and
- nearer to than to [1]

- 4 (a) 1 and 12 are factors of 12.

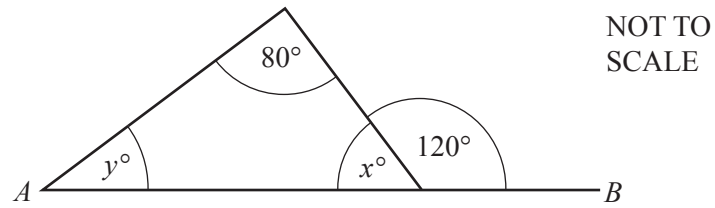
Write down all the other factors of 12.

..... [1]

- (b) Write down the multiples of 9 between 20 and 40.

..... [1]

5



In the diagram, AB is a straight line.

Find the value of x and the value of y .

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots [2]$$

6 Write 55 g as a percentage of 2.2 kg.

$$\dots\dots\dots \% [2]$$

7 The area of a triangle is 528 cm^2 .
The length of its base is 33 cm.

Calculate the perpendicular height of the triangle.

$$\dots\dots\dots \text{ cm } [2]$$

- 8 Amar cycles at a speed of 18 km/h.
It takes him 55 minutes to cycle between two villages.

Calculate the distance between the two villages.

..... km [2]

- 9 Work out, giving your answer in standard form.

$$1.2 \times 10^{40} + 1.2 \times 10^{41}$$

..... [2]

- 10 The sides of a triangle are 5.2 cm, 6.3 cm and 9.4 cm, each correct to the nearest millimetre.

Calculate the lower bound of the perimeter of the triangle.

..... cm [2]

- 11 Write the recurring decimal $0.\dot{4}\dot{8}$ as a fraction.
Show all your working.

..... [2]

- 12 Expand the brackets and simplify.

$$(5 - n)(3 + n)$$

..... [2]

- 13 (a) Write $\frac{11}{3}$ as a mixed number.

..... [1]

- (b) **Without using a calculator**, work out $\frac{1}{4} + \frac{5}{12}$.

Show all the steps of your working and give your answer as a fraction in its lowest terms.

..... [2]

- 14 Find the integers which satisfy the inequality.

$$-5 < 2n - 1 \leq 5$$

..... [3]

- 15 Write as a single fraction in its simplest form.

$$\frac{x+1}{x} - \frac{y-1}{y}$$

..... [3]

- 16 Here are the first four terms of a sequence.

23 17 11 5

- (a) Find the next term.

..... [1]

- (b) Find the n th term.

..... [2]

17



The diagram shows part of a regular polygon.
The exterior angle is x° .
The interior angle is $29x^\circ$.

Work out the number of sides of this polygon.

..... [3]

- 18** Solve the simultaneous equations.
You must show all your working.

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

$$x = \dots\dots\dots$$

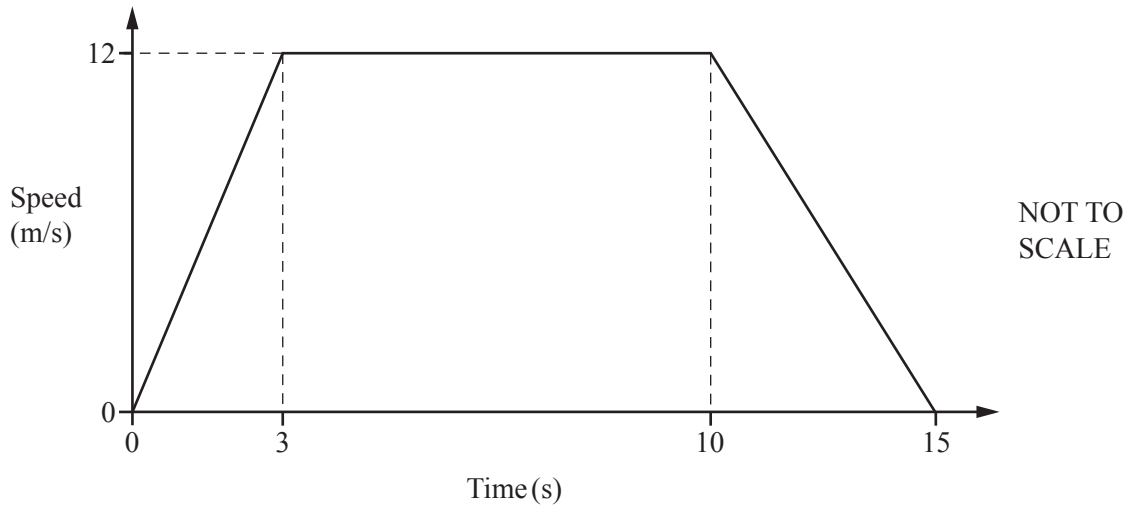
$$y = \dots\dots\dots [3]$$

- 19** Make x the subject of the formula.

$$y = \sqrt{x^2 + 1}$$

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

20

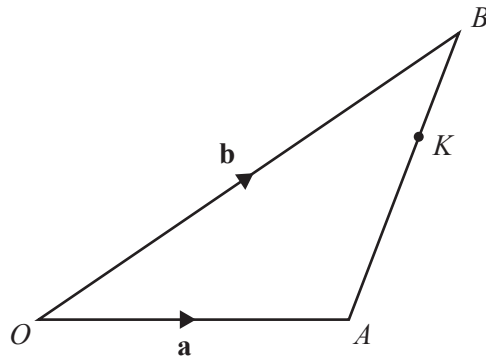


The diagram shows a speed-time graph.

Calculate the total distance travelled.

..... m [3]

21



NOT TO SCALE

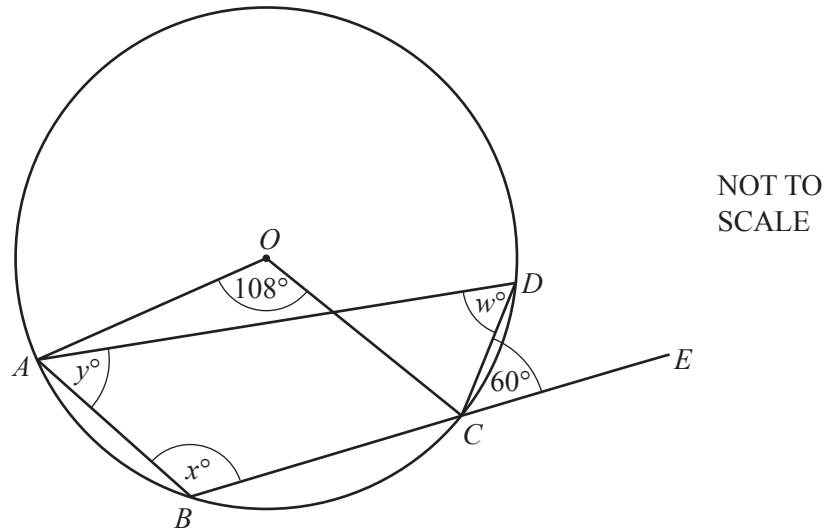
O is the origin and K is the point on AB so that $AK : KB = 2 : 1$.
 $\vec{OA} = \mathbf{a}$ and $\vec{OB} = \mathbf{b}$.

Find the position vector of K .

Give your answer in terms of $\mathbf{a}$ and $\mathbf{b}$ in its simplest form.

..... [3]

22



A, B, C and D are points on the circle, centre O .
 BCE is a straight line.
 Angle $AOC = 108^\circ$ and angle $DCE = 60^\circ$.

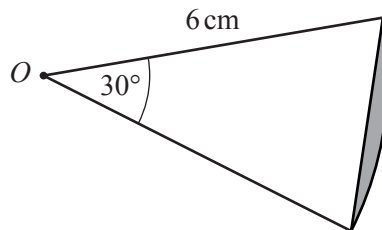
Calculate the values of w , x and y .

$w = \dots\dots\dots$

$x = \dots\dots\dots$

$y = \dots\dots\dots$ [3]

23



The diagram shows a sector of a circle, centre O and radius 6 cm.
 The sector angle is 30° .
 The area of the shaded segment is $(k\pi - c) \text{ cm}^2$, where k and c are integers.

Find the value of k and the value of c .

$k = \dots\dots\dots$

$c = \dots\dots\dots$ [3]

24 Solve the equations.

(a) $7 - 3n = 11n + 2$

$n = \dots\dots\dots$ [2]

(b) $\frac{p-3}{5} = 3$

$p = \dots\dots\dots$ [2]

25 Factorise completely.

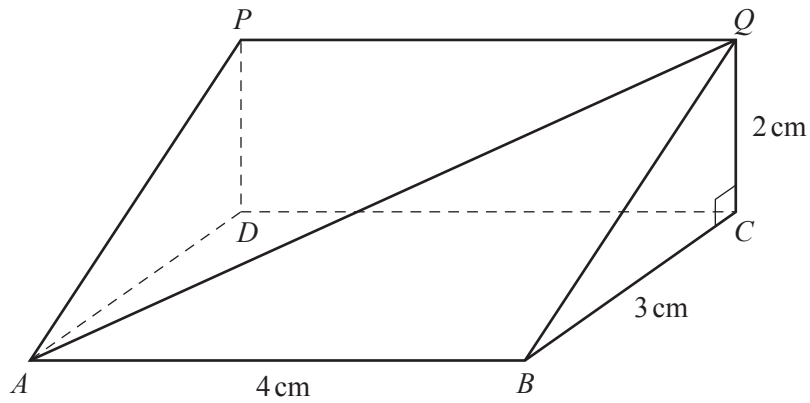
(a) $x^2 - x - 132$

$\dots\dots\dots$ [2]

(b) $x^3 - 4x$

$\dots\dots\dots$ [2]

26

NOT TO
SCALE

The diagram shows a prism of length 4 cm.
The cross section is a right-angled triangle.
 $BC = 3$ cm and $CQ = 2$ cm.

Calculate the angle between the line AQ and the base, $ABCD$, of the prism.

..... [4]

27 Simplify.

(a) $81^{\frac{3}{4}}$

..... [1]

(b) $x^{\frac{2}{3}} \div x^{-\frac{4}{3}}$

..... [1]

(c) $\left(\frac{8}{y^6}\right)^{-\frac{1}{3}}$

..... [2]

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