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**0580/23**

October/November 2010

**1 hour 30 minutes**

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

Write your Centre number, candidate number and name on all the work you hand in.  
Write in dark blue or black pen.  
You may use a pencil for any diagrams or graphs.  
Do not use staples, paper clips, highlighters, glue or correction fluid.  
**DO NOT WRITE IN ANY BARCODES.**

For  $\pi$ , use either your calculator value or 3.142.

The total of the marks for this paper is 70.



**[Turn over**

- 1 Write down the number which is 3.6 less than  $-4.7$ .

For  
Examiner's  
Use

Answer ..... [1]

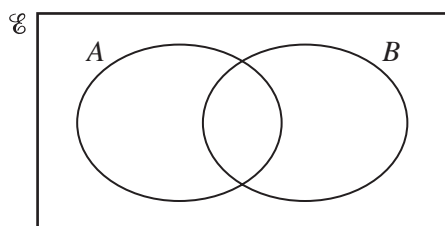
- 2 A plane took 1 hour and 10 minutes to fly from Riyadh to Jeddah.  
The plane arrived in Jeddah at 23 05.  
At what time did the plane depart from Riyadh?

Answer ..... [1]

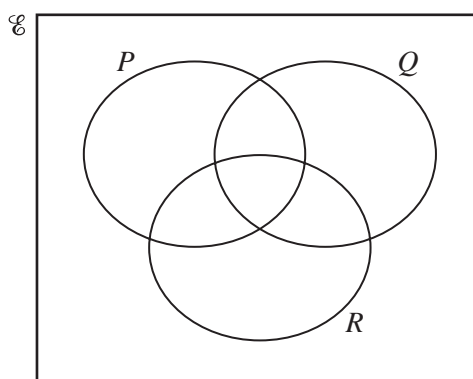
- 3 Calculate  $\sqrt[3]{2.35^2 - 1.09^2}$ .  
Give your answer correct to 4 decimal places.

Answer ..... [2]

- 4 Shade the required region on each Venn diagram.



$A \cap B'$



$(P \cup Q) \cap R'$

[2]

5 Show that  $3\frac{3}{4} + 1\frac{1}{3} = 5\frac{1}{12}$ .

Write down all the steps in your working.

*Answer*

[2]

6 Write the following in order of size, **smallest** first.

$$\frac{20}{41}$$

$$\frac{80}{161}$$

0.492

4.93%

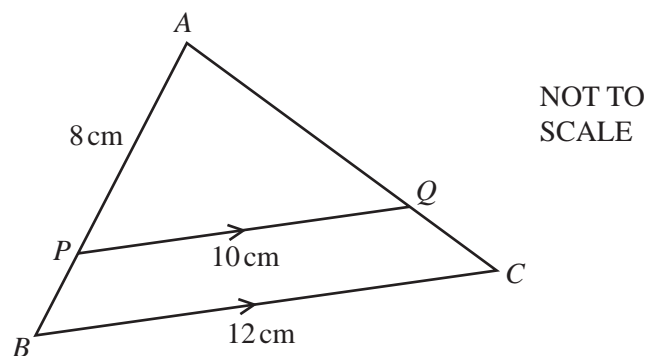
*Answer* ..... < ..... < ..... < ..... [2]

- 7 In France, the cost of one kilogram of apricots is €3.38 .  
In the UK, the cost of one kilogram of apricots is £4.39 .  
£1 = €1.04.  
Calculate the difference between these prices.  
Give your answer in pounds (£).

*Answer* £ ..... [2]

- 8 A large rectangular card measures 80 centimetres by 90 centimetres.  
Maria uses **all** this card to make small rectangular cards measuring 40 **millimetres** by 15 **millimetres**.  
Calculate the number of small cards.

*Answer* ..... [2]



$APB$  and  $AQC$  are straight lines.  $PQ$  is parallel to  $BC$ .  
 $AP = 8$  cm,  $PQ = 10$  cm and  $BC = 12$  cm.  
 Calculate the length of  $AB$ .

Answer  $AB =$  ..... cm [2]

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- 10** Nikhil invests \$200 for 2 years at 4% per year **compound** interest.  
 Calculate the **exact** amount Nikhil has after 2 years.

Answer \$ ..... [2]

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- 11** In a group of 24 students, 21 like football and 15 like swimming.  
 One student does **not** like football and does **not** like swimming.  
 Find the number of students who like **both** football and swimming.

Answer ..... [2]

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- 12** The side of a square is 6.3 cm, correct to the nearest millimetre.  
The lower bound of the perimeter of the square is  $u$  cm and the upper bound of the perimeter is  $v$  cm.  
Calculate the value of

**(a)**  $u$ ,

Answer(a)  $u =$  ..... [1]

**(b)**  $v - u$ .

Answer(b)  $v - u =$  ..... [1]

**13**  $a \times 10^7 + b \times 10^6 = c \times 10^6$

Find  $c$  in terms of  $a$  and  $b$ .

Give your answer in its simplest form.

Answer  $c =$  ..... [2]

- 14** Priyantha completes a 10 km run in 55 minutes 20 seconds.  
Calculate Priyantha's average speed in km/h.

Answer ..... km/h [3]

- 15 Find the equation of the straight line which passes through the points (0, 8) and (3, 2).

For  
Examiner's  
Use

Answer ..... [3]

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16  $\frac{g}{2} = \sqrt{\frac{h}{i}}$

Find  $i$  in terms of  $g$  and  $h$ .

Answer  $i =$  ..... [3]

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- 17 Solve the simultaneous equations.

$$5x - y = -10$$

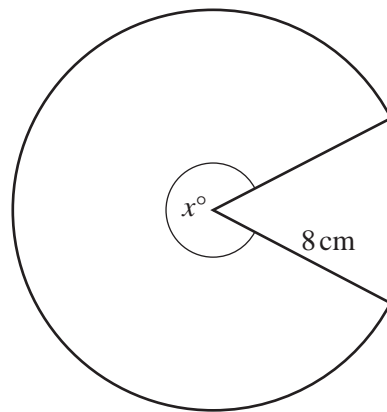
$$x + 2y = 9$$

Answer  $x =$  .....

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

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18

NOT TO  
SCALE

The diagram shows a sector of a circle of radius 8 cm.  
 The angle of the sector is  $x^\circ$ .  
 The perimeter of the sector is  $(16 + 14\pi)$  cm.

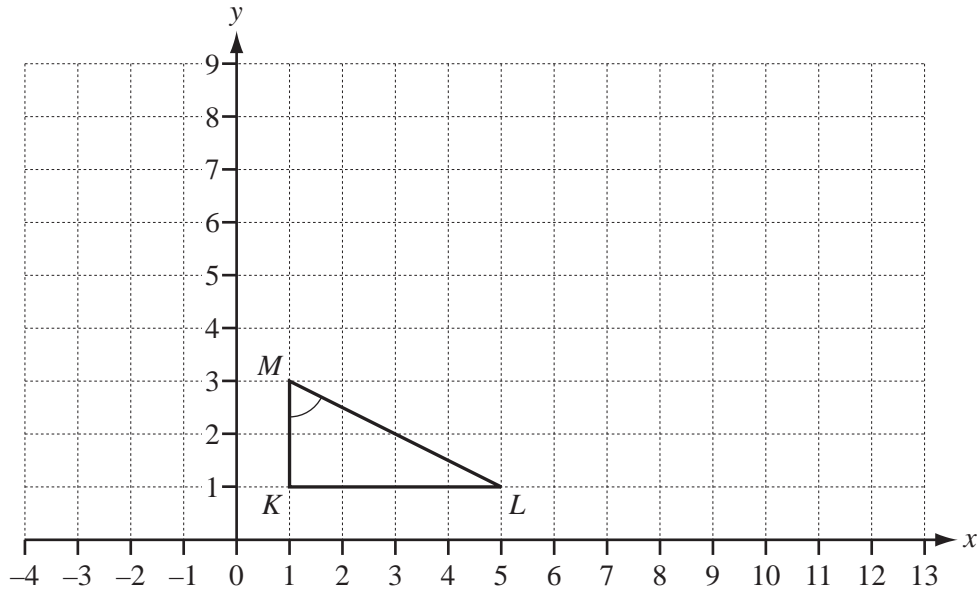
Find the value of  $x$ .

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

- 19 A model of a car is made to a scale of 1 : 40.  
 The volume of the model is  $45 \text{ cm}^3$ .  
 Calculate the volume of the car.  
 Give your answer in  $\text{m}^3$ .

Answer .....  $\text{m}^3$  [3]

For  
Examiner's  
Use

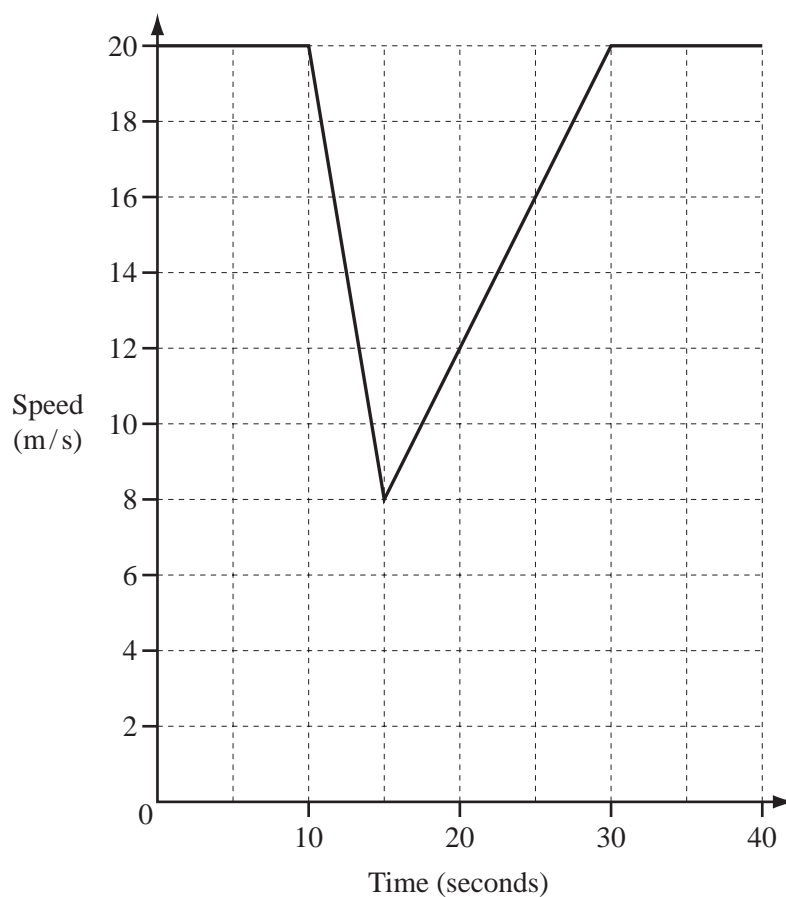


The triangle  $KLM$  is shown on the grid.

- (a) Calculate angle  $KML$ .

Answer(a) Angle  $KML$  = ..... [2]

- (b) On the grid, draw the shear of triangle  $KLM$ , with a shear factor of 3 and the  $x$ -axis invariant. [2]



The graph shows 40 seconds of a car journey.

The car travelled at a constant speed of 20 m/s, decelerated to 8 m/s then accelerated back to 20 m/s.

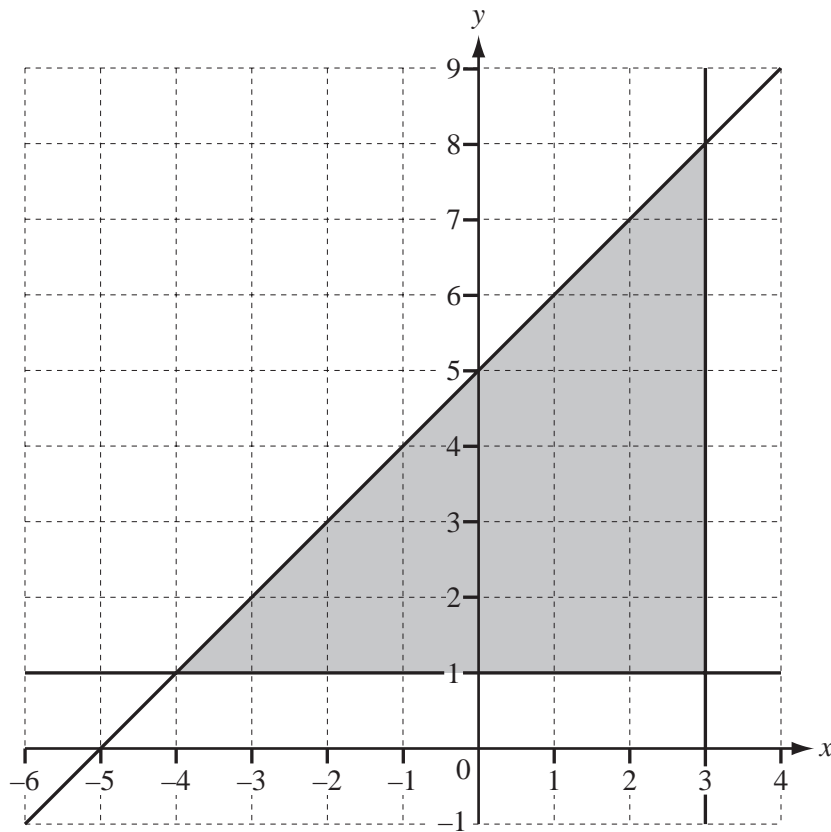
Calculate

**(a)** the deceleration of the car,

Answer(a) .....  $\text{m/s}^2$  [1]

**(b)** the total distance travelled by the car during the 40 seconds.

Answer(b) ..... m [3]



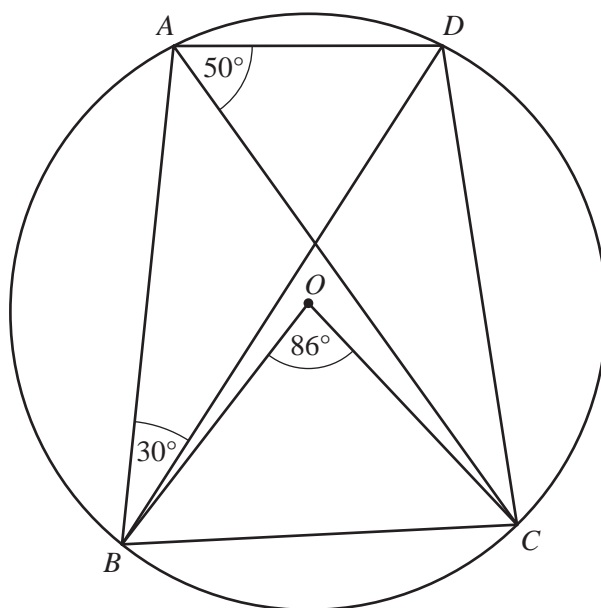
Find the three inequalities which define the shaded triangle in the diagram.

Answer .....

.....

.....

[5]

NOT TO  
SCALE

The points  $A$ ,  $B$ ,  $C$  and  $D$  lie on the circumference of the circle, centre  $O$ .

Angle  $ABD = 30^\circ$ , angle  $CAD = 50^\circ$  and angle  $BOC = 86^\circ$ .

- (a) Give the reason why angle  $DBC = 50^\circ$ .

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

- (b) Find

- (i) angle  $ADC$ ,

Answer(b)(i) Angle  $ADC =$  ..... [1]

- (ii) angle  $BDC$ ,

Answer(b)(ii) Angle  $BDC =$  ..... [1]

- (iii) angle  $OBD$ .

Answer(b)(iii) Angle  $OBD =$  ..... [2]

Questions 24 and 25 are printed on the next page.

- 24 (a)** Write  $\frac{1}{y} - \frac{2}{x}$  as a single fraction in its lowest terms.

For  
Examiner's  
Use

Answer(a) [2]

- (b)** Write  $\frac{x^2 + x}{3x + 3}$  in its lowest terms.

Answer(b) [3]

- 25**  $f: x \rightarrow 2x - 7$        $g: x \rightarrow \frac{1}{x}$

Find

- (a)**  $fg\left(\frac{1}{2}\right),$

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

- (b)**  $gf(x),$

Answer(b)  $gf(x) =$  [1]

- (c)**  $f^{-1}(x).$

Answer(c)  $f^{-1}(x) =$  [2]

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