UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

* 7 8 4 7 7 0 3 7 4 *

MATHEMATICS **0580/23**

Paper 2 (Extended) **October/November 2010**

1 hour 30 minutes

Candidates answer on the Question Paper.

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

READ THESE INSTRUCTIONS FIRST

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.

Answer **all** questions.
If working is needed for any question it must be shown below that question.
Electronic calculators should be used.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.
For π, use either your calculator value or 3.142.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total of the marks for this paper is 70.

This document consists of **12** printed pages.

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

Answer ..... [1]

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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]

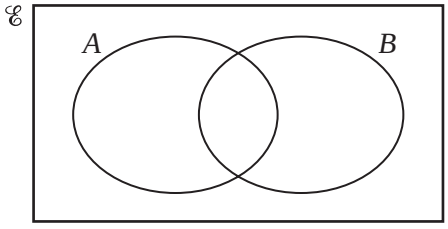
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3 Calculate $\sqrt[3]{2.35^2 - 1.09^2}$.
Give your answer correct to 4 decimal places.

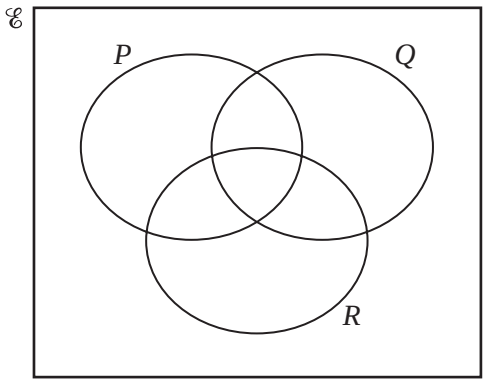
Answer ..... [2]

---

4 Shade the required region on each Venn diagram.



$A \cap B'$



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

[2]

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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]

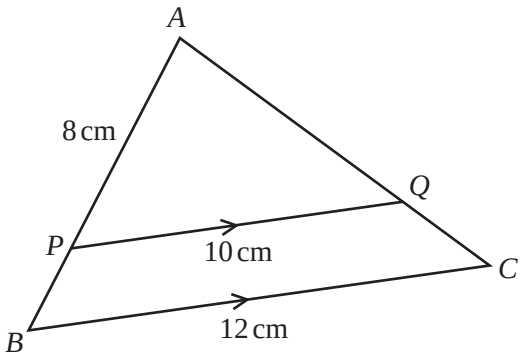
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8 A large rectangular card measures 80 centimetres by 90 centimetres.
Maria uses **all** this card to make small rectangular cards measuring 40 **millimetres** by 15 **millimetres**.
Calculate the number of small cards.

Answer ..... [2]

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9



NOT TO SCALE

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]

---

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

Answer $ ..... [2]

---

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]

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

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]

---

17 Solve the simultaneous equations.

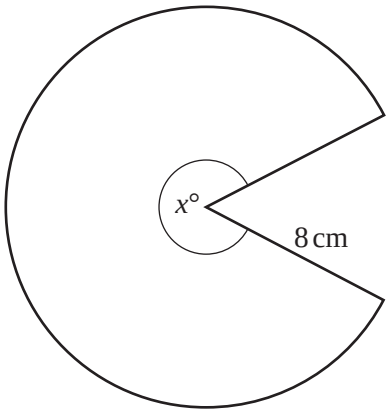
$$5x - y = -10$$
$$x + 2y = 9$$

Answer $x =$ .....

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

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NOT TO SCALE

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

Find the value of x.

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

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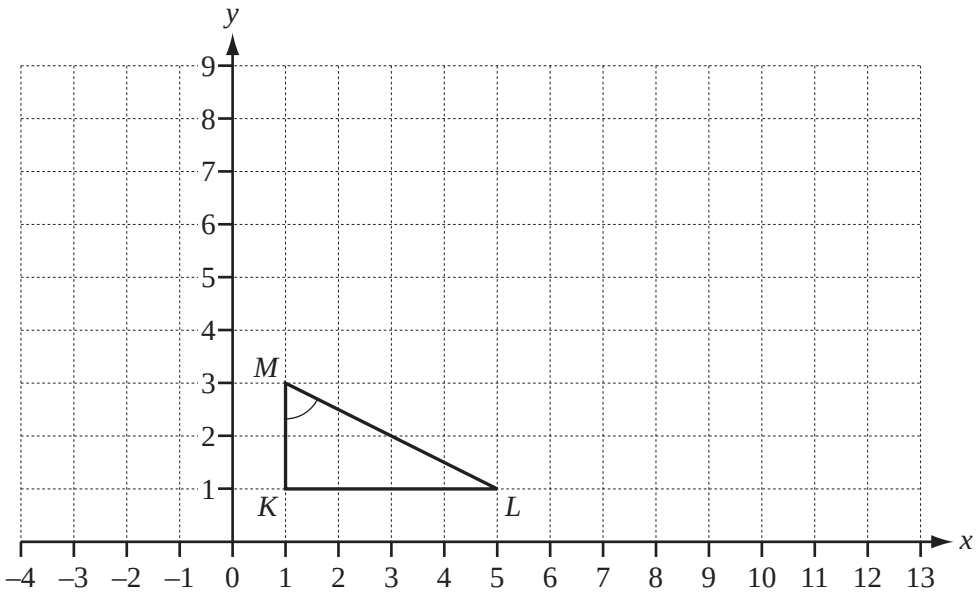
19 A model of a car is made to a scale of 1 : 40.
The volume of the model is 45 cm^3.
Calculate the volume of the car.
Give your answer in m^3.

Answer ..... m^3 [3]

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The triangle *KLM* is shown on the grid.

(a) Calculate angle *KML*.

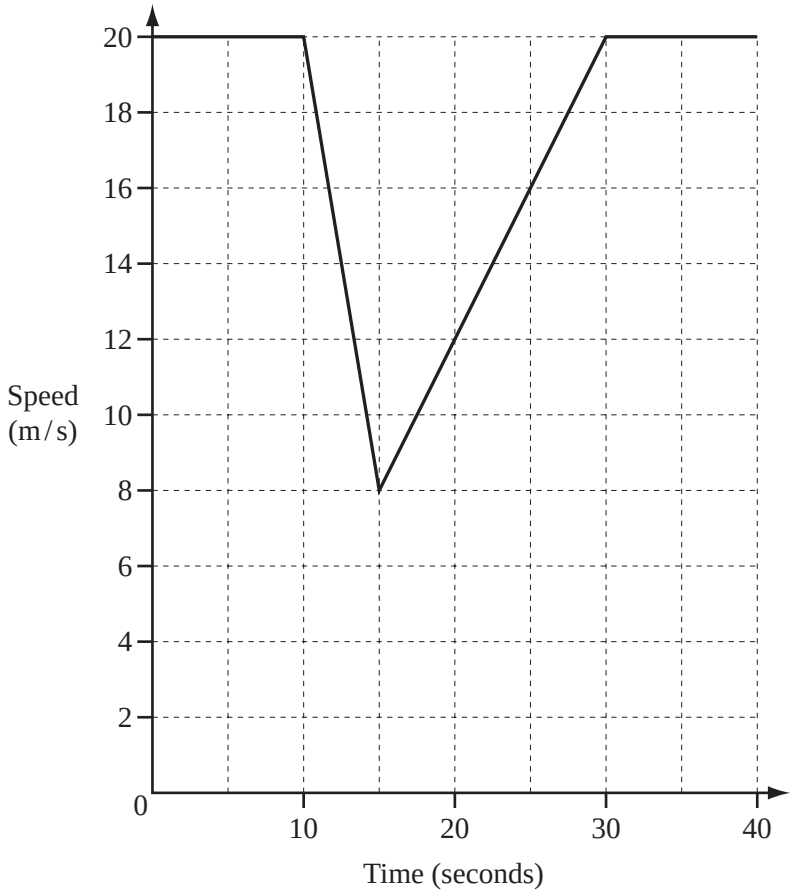
Answer(a) Angle *KML* = ... [2]

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

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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,

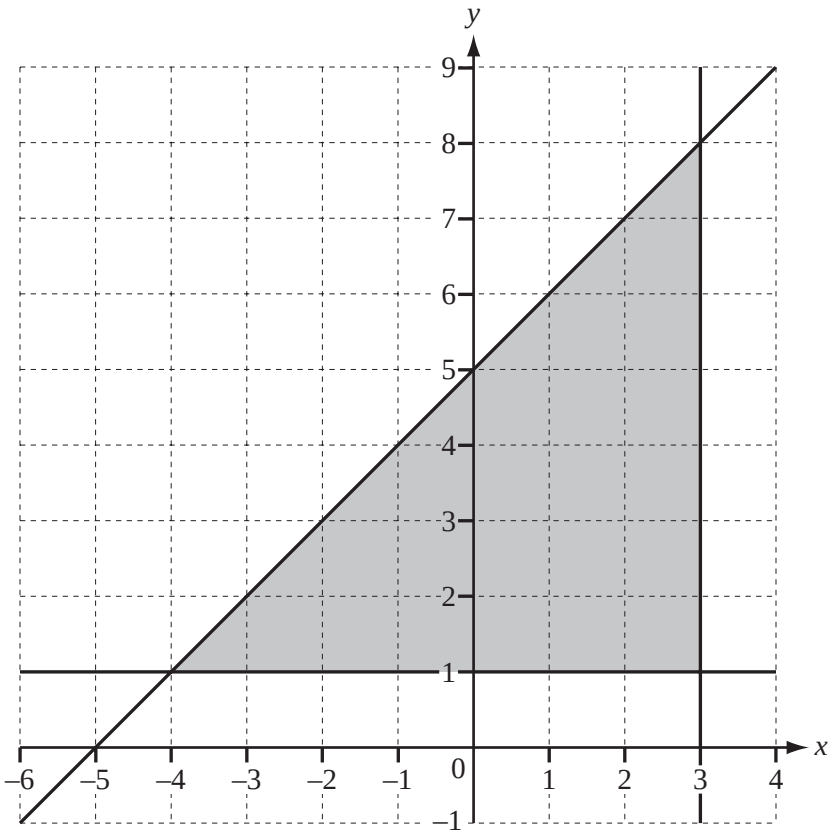
Answer(a) ..... m/s^2 [1]

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

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

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

Answer .....

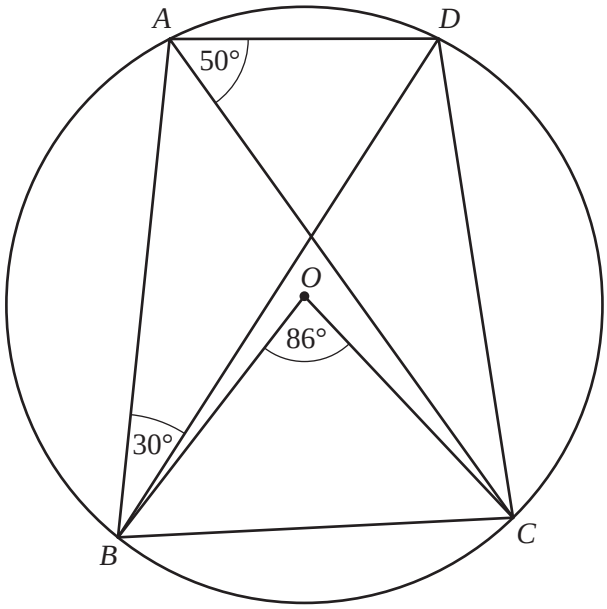
.....

..... [5]

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23

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NOT TO SCALE

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

Angle $ABD = 30°$, angle $CAD = 50°$ and angle $BOC = 86°$.

(a) Give the reason why angle $DBC = 50°$.

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.

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

Answer(a) [2]

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

Answer(b) [3]

---

25 $f: x \to 2x - 7$ $\quad$ $g: x \to \frac{1}{x}$

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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