UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

MATHEMATICS **0580/11**

Paper 1 (Core) **October/November 2011**

1 hour

Candidates answer on the Question Paper.

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

READ THESE INSTRUCTIONS FIRST

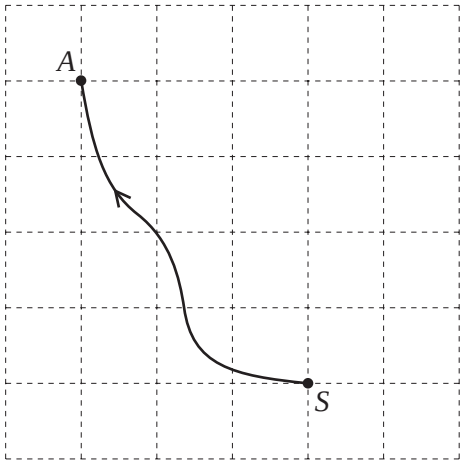
Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

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 56.

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

1



The diagram shows the map of part of an orienteering course.
Sanji runs from the start, S, to the point A.

Write $\overrightarrow{SA}$ as a column vector.

Answer $\begin{pmatrix} \\ \end{pmatrix}$ [1]

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2 When Ali takes a penalty, the probability that he will score a goal is $\frac{4}{5}$.

Ali takes 30 penalties.

Find how many times he is expected to score a goal.

Answer ..... [2]

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3 The ratio of Anne's height : Ben's height is 7 : 9.
Anne's height is 1.4 m.

Find Ben's height.

Answer ..... m [2]

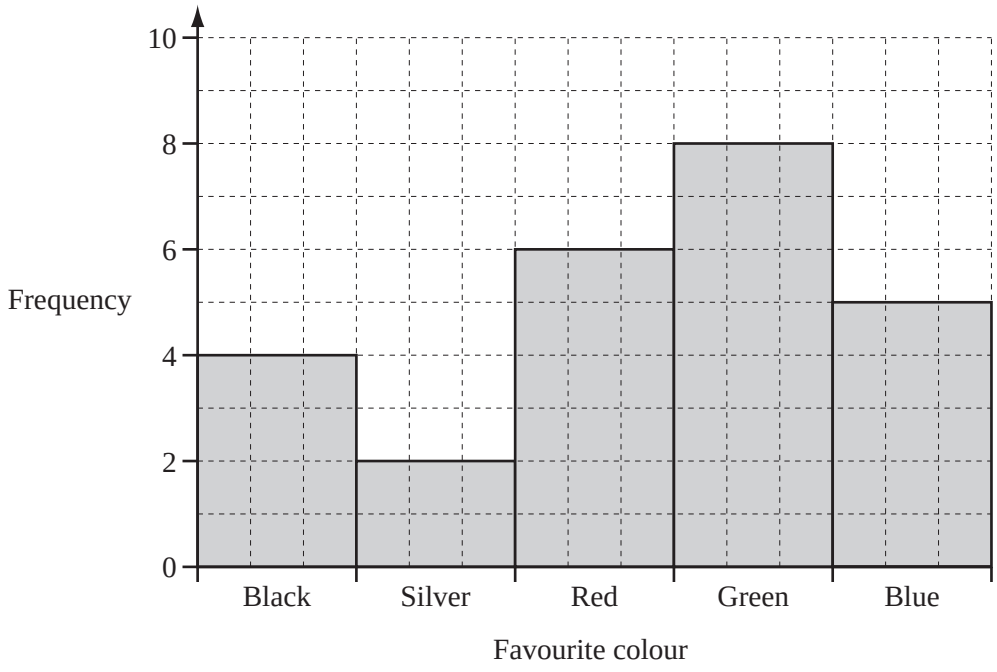
For Examiner's Use

4 The distance between the centres of two villages is 8 km.
A map on which they are shown has a scale of 1 : 50 000.

Calculate the distance between the centres of the two villages on the map.
Give your answer in centimetres.

Answer ..... cm [2]

5



The bar chart shows the favourite colours of students in a class.

(a) How many students are in the class?

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

(b) Write down the modal colour.

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

[Turn over

For Examiner's Use

6 Use your calculator to find $\sqrt{\frac{45 \times 5.75}{3.1 + 1.5}}$.

Answer ..... [2]

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7 **(a)** Calculate 60% of 200.

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

(b) Write 0.36 as a fraction.
Give your answer in its lowest terms.

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

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8 A circle has a radius of 50 cm.

(a) Calculate the area of the circle in cm^2.

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

(b) Write your answer to **part (a)** in m^2.

Answer(b) ..... m^2 [1]

For Examiner's Use

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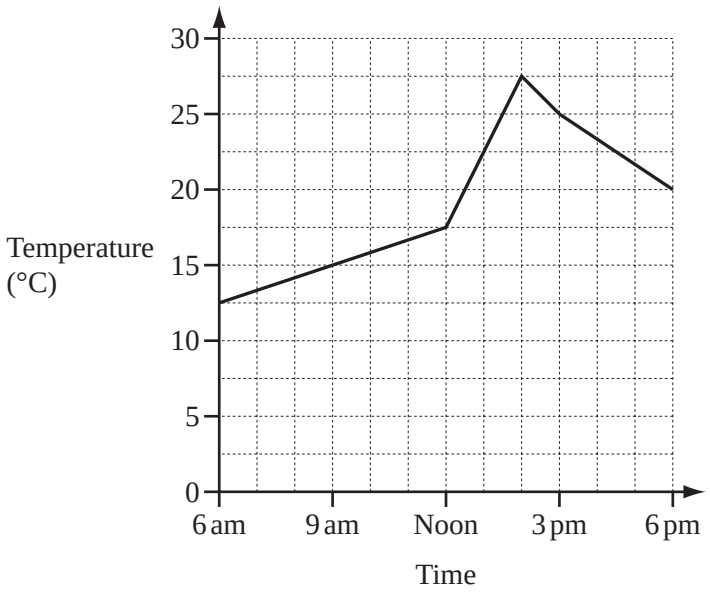

The graph shows the temperature in Paris from 6 am to 6 pm one day.

(a) What was the temperature at 9 am?

Answer(a) ..... °C [1]

(b) Between which two times was the temperature decreasing?

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

(c) Work out the difference between the maximum and minimum temperatures shown.

Answer(c) ..... °C [1]

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10 **(a)** Write down the mathematical name of a quadrilateral that has exactly two lines of symmetry.

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

(b) Write down the mathematical name of a triangle with exactly one line of symmetry.

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

(c) Write down the order of rotational symmetry of a regular pentagon.

Answer(c) ..... [1]

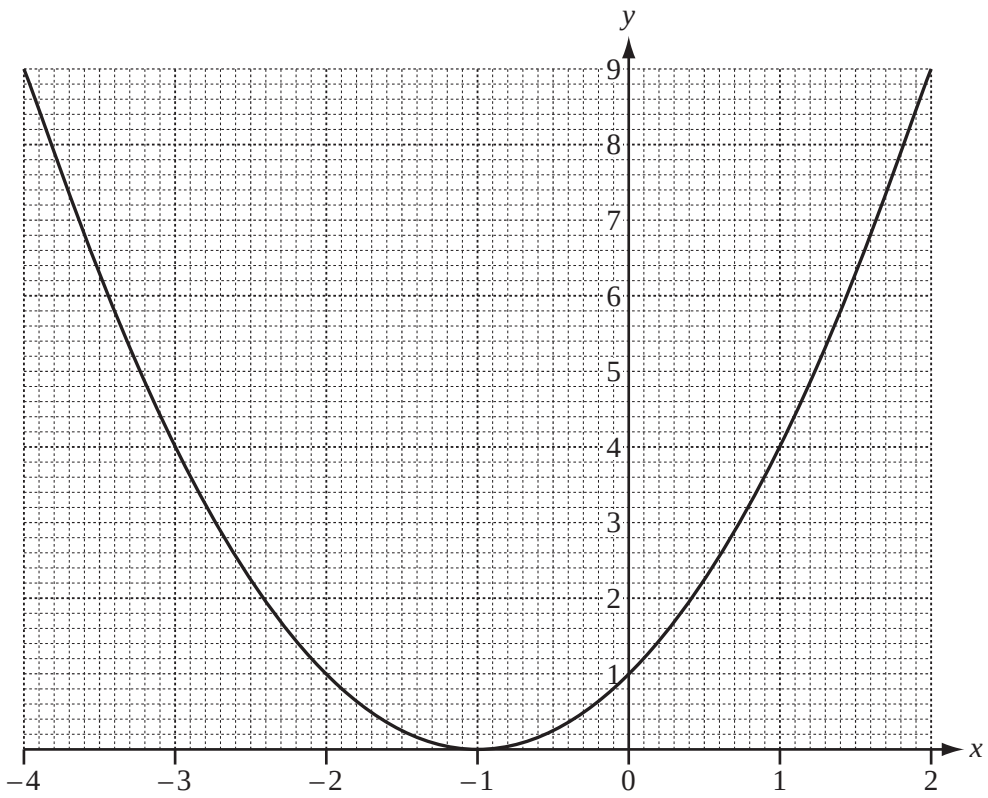
[Turn over

11 Without using your calculator, work out $\frac{1}{2}\left(\frac{2}{3}+\frac{1}{4}\right)$.

Show all your working clearly and give your answer as a fraction.

Answer ..... [3]

12



The diagram shows the graph of $y = (x + 1)^2$ for $-4 \leqslant x \leqslant 2$.

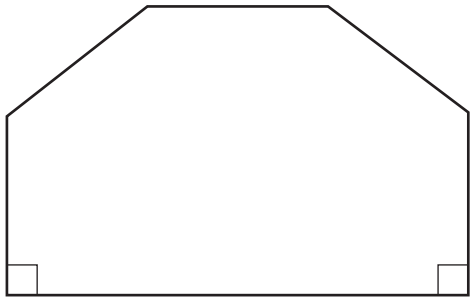
(a) On the same grid, draw the line $y = 3$. [1]

(b) Use your graph to find the solutions of $(x + 1)^2 = 3$.
Give each solution correct to 1 decimal place.

Answer(b) $x =$ ..... or $x =$ ..... [2]

For Examiner's Use

13



NOT TO SCALE

The front of a house is in the shape of a hexagon with two right angles.
The other four angles are all the same size.

Calculate the size of one of these angles.

Answer ..... [3]

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14 **(a)** Expand and simplify.

$$2(3x - 2) + 3(x - 2)$$

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

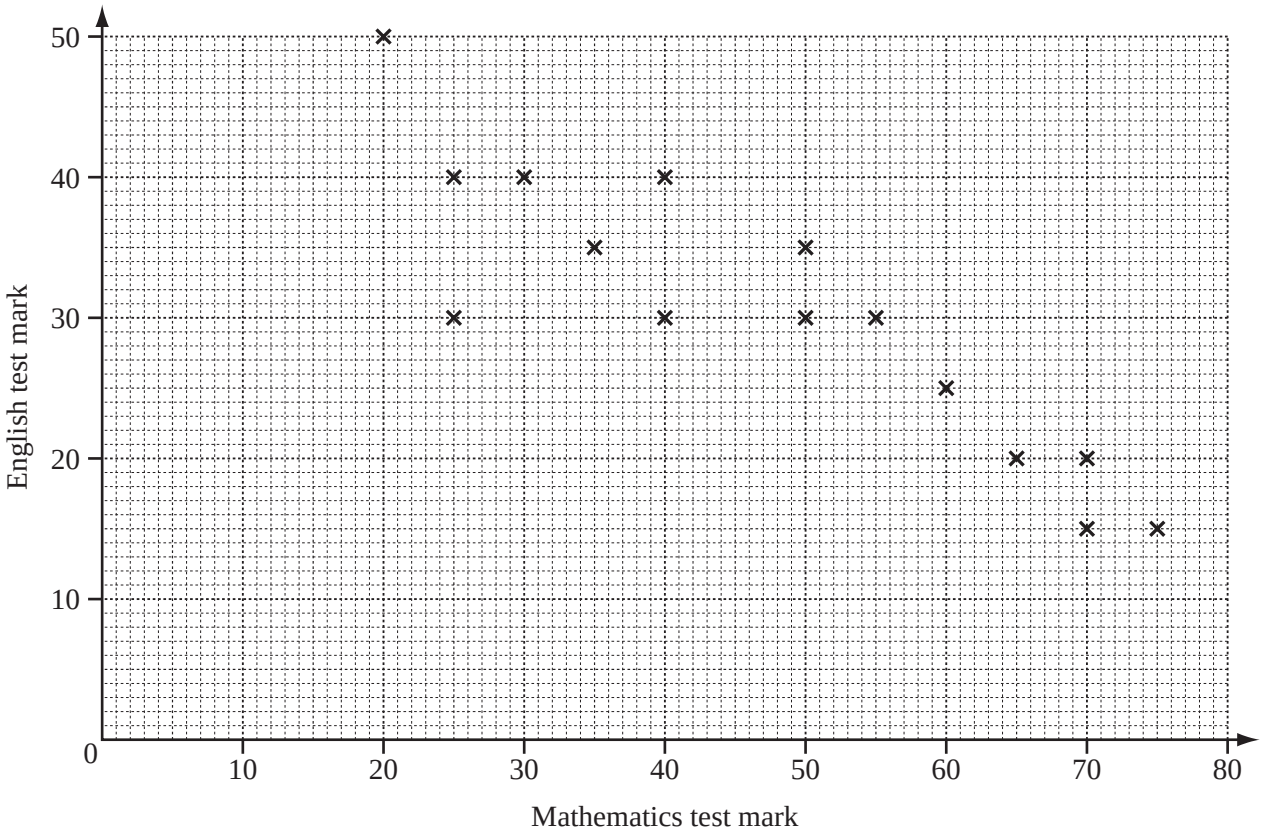
(b) Expand.

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

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

[Turn over

15



The scatter diagram shows the marks obtained in a Mathematics test and the marks obtained in an English test by 15 students.

(a) Describe the correlation.

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

(b) The mean for the Mathematics test is 47.3 .
The mean for the English test is 30.3 .

Plot the mean point (47.3, 30.3) on the scatter diagram above. [1]

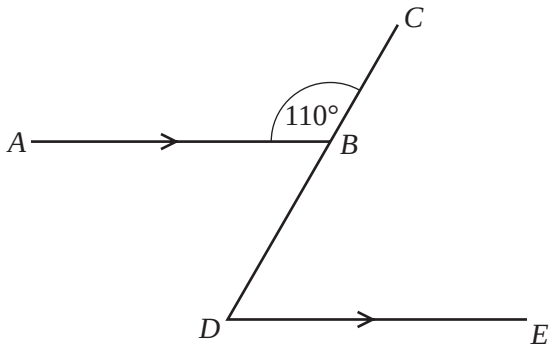
(c) **(i)** Draw the line of best fit on the diagram above. [1]

(ii) One student missed the English test.
She received 45 marks in the Mathematics test.

Use your line to estimate the mark she might have gained in the English test.

Answer(c)(ii) ..... [1]

16 (a)



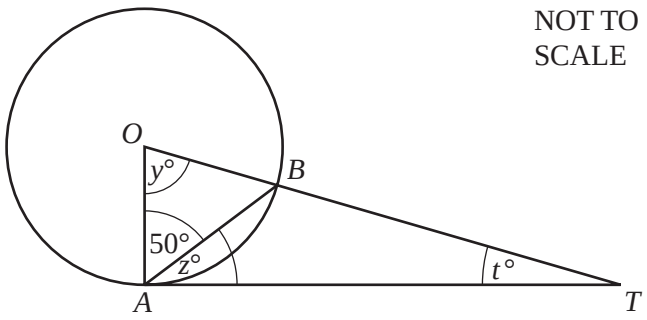
NOT TO SCALE

In the diagram, AB is parallel to DE.
Angle $ABC = 110°$.

Find angle BDE.

Answer(a) Angle BDE = ... [2]

(b)



NOT TO SCALE

TA is a tangent at A to the circle, centre O.
Angle $OAB = 50°$.

Find the value of

(i) y,

Answer(b)(i) y = ... [1]

(ii) z,

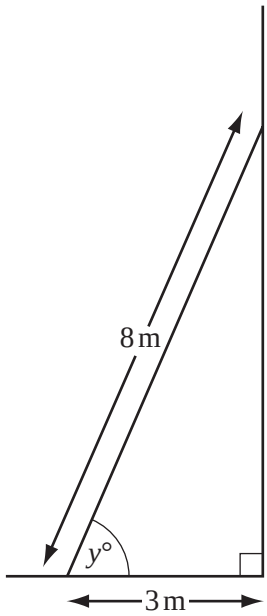
Answer(b)(ii) z = ... [1]

(iii) t.

Answer(b)(iii) t = ... [1]

[Turn over

17



NOT TO SCALE

The diagram shows a ladder, of length 8 m, leaning against a vertical wall.
The bottom of the ladder stands on horizontal ground, 3 m from the wall.

(a) Find the height of the top of the ladder above the ground.

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

(b) Use trigonometry to calculate the value of y.

Answer(b) $y =$ ..... [2]

For Examiner's Use

18 **(a)** Lucinda invests \$500 at a rate of 5% per year **simple** interest.

Calculate the interest Lucinda has after 3 years.

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

(b) Andy invests \$500 at a rate of 5% per year **compound** interest.

Calculate how much more interest Andy has than Lucinda after 3 years.

Answer(b) \$ ..... [4]

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