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0580/13

October/November 2011

1 hour

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

The total of the marks for this paper is 56.

[Turn over

- 1 During April the probability that it will rain on any one day is $\frac{5}{6}$.
On how many of the 30 days in April would it be expected to rain?

Answer [1]

- 2 (a) Write, in figures, the number

one hundred and five thousand and two.

Answer(a) [1]

- (b) Write your answer to **part (a)** correct to the nearest ten thousand.

Answer(b) [1]

- 3 Simplify the expression.

$$7x + 11y + x - 6y$$

Answer [2]

- 4 Insert **one** pair of brackets into each calculation to make the answer correct.

(a) $7 \times 6 - 3 + 5 = 26$ [1]

(b) $8 - 6 \times 4 - 1 = -10$ [1]

- 5 Write the following in order of size, starting with the smallest.

$$0.525 \quad \frac{11}{21} \quad \frac{111}{211} \quad 52.4\%$$

For
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Answer < < < [2]

- 6 Thomas fills glasses from a jug containing 2.4 litres of water.
Each glass holds 30 centilitres.

How many glasses can Thomas fill?

Answer [2]

- 7 Martha divides \$240 between spending and saving in the ratio

$$\text{spending : saving} = 7 : 8.$$

Calculate the amount Martha has for spending.

Answer \$ [2]

8 210 211 212 213 214 215 216

From the list of numbers, find

(a) a prime number,

Answer(a) [1]

(b) a cube number.

Answer(b) [1]

9 Calculate the selling price of a bicycle bought for \$120 and sold at a profit of 15%.

Answer \$ [2]

10 Solve the simultaneous equations.

$$\begin{aligned}x + 5y &= 22 \\x + 3y &= 12\end{aligned}$$

Answer x =

y = [2]

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- 11 Solve the equation.

$$\frac{2x-3}{2} = 2$$

Answer $x =$ [2]

- 12 The population of a city is 128 000, correct to the nearest thousand.

(a) Write 128 000 in standard form.

Answer(a) [1]

(b) Write down the upper bound of the population.

Answer(b) [1]

- 13 Pedro invested \$800 at a rate of 5% per year **compound** interest.
Calculate the **total** amount he has after 2 years.

Answer \$ [2]

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- 14 Factorise completely.

$$5g^2h + 10hj$$

Answer [2]

- 15 For her holiday, Dina changed 500 Swiss francs (CHF) into pounds (£).
The rate was £1 = CHF 1.6734.

Calculate how much Dina received in pounds.
Give your answer correct to 2 decimal places.

Answer £ [2]

- 16 Simplify

$$4x^4 \times 5x^5.$$

Answer [2]

- 17 The scale of a map is 1 : 500 000.
On the map the centres of two cities are 26 cm apart.

Calculate the actual distance, in kilometres, between the centres of the two cities.

*For
Examiner's
Use*

Answer km [2]

- 18 Show that $3^{-2} + 2^{-2} = \frac{13}{36}$.

Write down all the steps of your working.

Answer

[2]

- 19 In Vienna, the mid-day temperatures, in $^{\circ}\text{C}$, are recorded during a week in December.
This information is shown below.

−2 2 1 −3 −1 −2 0

Calculate

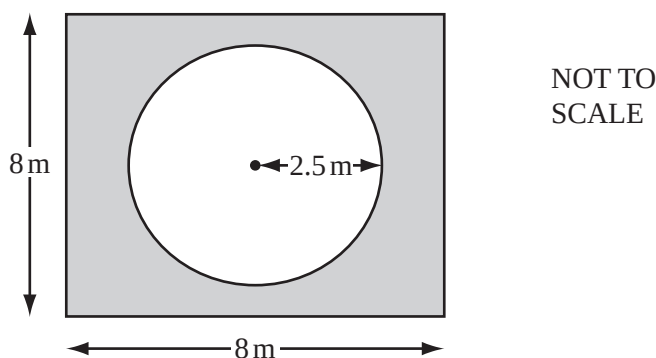
- (a) the difference between the highest temperature and the lowest temperature,

Answer(a) $^{\circ}\text{C}$ [1]

- (b) the mean temperature.

Answer(b) $^{\circ}\text{C}$ [2]

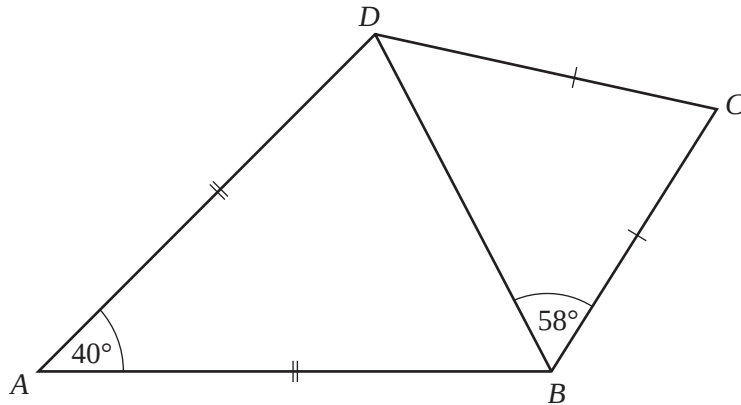
20



The diagram shows a circular pool of radius 2.5 m.
A square piece of land surrounds the pool.
Each side of the square is 8 m long.

Calculate the shaded area of the land that surrounds the pool.

Answer m^2 [3]

NOT TO
SCALE

In the quadrilateral $ABCD$, $AB = AD$ and $CB = CD$.

Angle $BAD = 40^\circ$ and angle $CBD = 58^\circ$.

(a) Calculate

(i) angle ABD ,

Answer(a)(i) Angle $ABD = \dots\dots\dots$ [1]

(ii) angle BCD .

Answer(a)(ii) Angle $BCD = \dots\dots\dots$ [1]

(b) Write down the mathematical name for the quadrilateral $ABCD$.

Answer(b) $\dots\dots\dots$ [1]

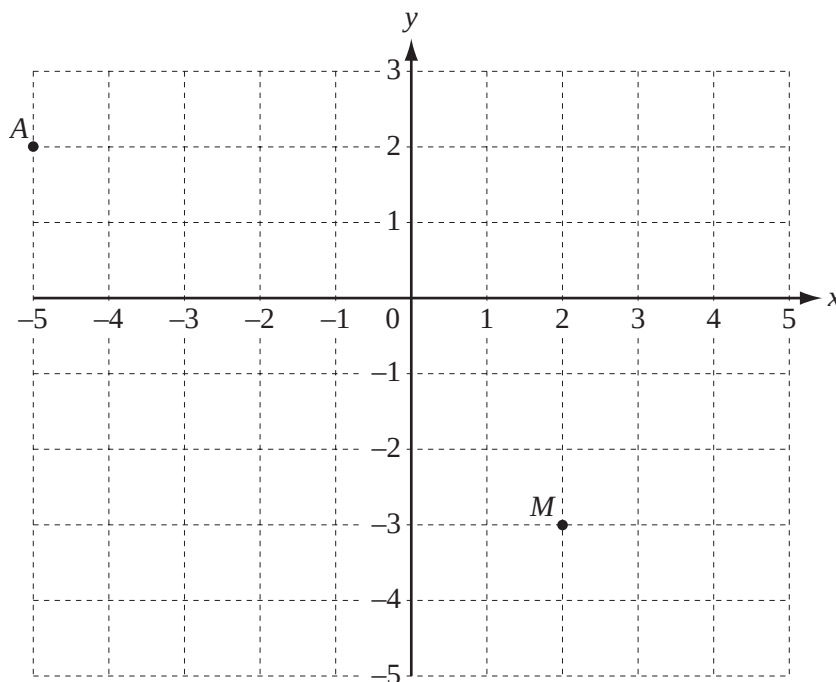
22 (a) Calculate $\frac{700}{28.6^3}$.

For
Examiner's
Use

Answer(a) [1]

(b) Work out $(8 \times 10^6)^2$, giving your answer in standard form.

Answer(b) [2]



The diagram shows two points $A(-5, 2)$ and $M(2, -3)$.

(a) B is the point $(5, -2)$.

(i) On the grid, mark the point B .

[1]

(ii) Write $\vec{AB}$ as a column vector.

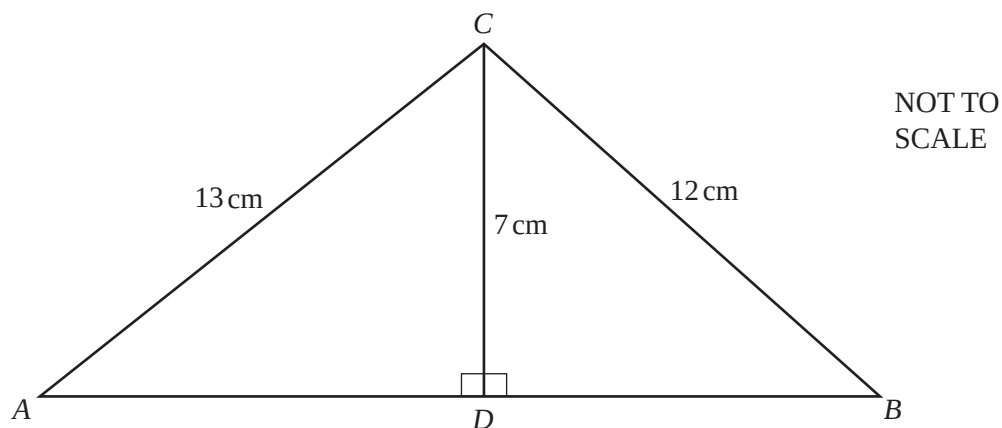
$$\text{Answer(a)(ii)} \quad \vec{AB} = \begin{pmatrix} \\ \end{pmatrix} \quad [1]$$

(b) M is the midpoint of the line BD .

Find the co-ordinates of D .

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

Question 24 is printed on the next page.



In triangle ABC , D is on AB so that $\angle ADC = \angle BDC = 90^\circ$.

$AC = 13$ cm, $BC = 12$ cm and $CD = 7$ cm.

(a) Calculate the length of DB .

Answer(a) $DB =$ cm [3]

(b) Use trigonometry to calculate angle CAD .

Answer(b) Angle $CAD =$ [2]