Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

5844369115

MATHEMATICS **0580/22**

Paper 2 (Extended) **February/March 2015**

1 hour 30 minutes

Candidates answer on the Question Paper.

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

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 an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, 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.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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

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1 The number of hot drinks sold in a café decreases as the weather becomes warmer.

What type of correlation does this statement show?

Answer ..... [1]

---

2 Find the lowest common multiple (LCM) of 24 and 32.

Answer ..... [2]

---

3 The base of a rectangular tank is 1.2 metres by 0.9 metres.
The water in the tank is 53 **centimetres** deep.

Calculate the number of litres of water in the tank.

Answer ..... litres [2]

---

4 Factorise $14p^2 + 21pq$.

Answer ..... [2]

---

5 These are the first five terms of a sequence.

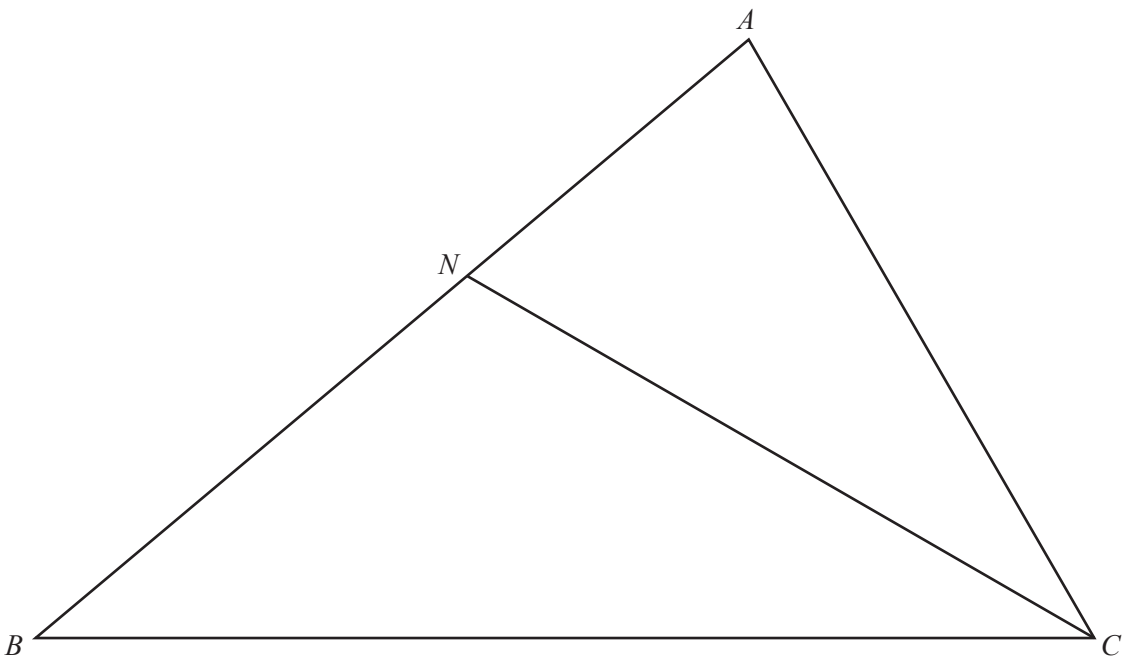
13 8 3 –2 –7

Find the nth term of this sequence.

Answer ..... [2]

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6



In triangle ABC, CN is the bisector of angle ACB.

(a) **Using a ruler and compasses only**, construct the locus of points inside triangle ABC that are 5.7 cm from B. [1]

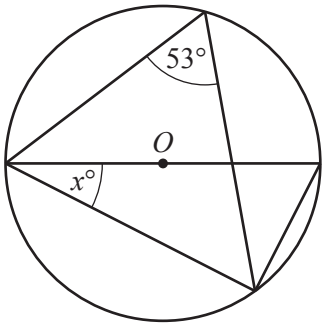
(b) Shade the region inside triangle ABC that is

- more than 5.7 cm from B

and

- nearer to BC than to AC. [1]

7



NOT TO SCALE

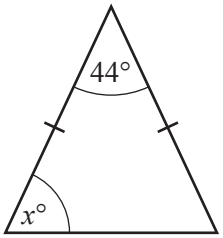
The diagram shows a circle, centre O.

Find the value of x.

Answer $x =$ ..... [2]

---

8 **(a)**



NOT TO SCALE

The diagram shows an isosceles triangle.

Find the value of x.

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

(b) The exterior angle of a regular polygon is 24°.

Find the number of sides of this regular polygon.

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

---

9 Ahmed, Batuk and Chand share \$1000 in the ratio 8 : 7 : 5.

Calculate the amount each receives.

Answer Ahmed \$ .....

Batuk \$ .....

Chand \$ ..... [3]

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10 Pavan saves \$$x$ each month.
His two brothers **each** save \$4 more than Pavan each month.

Altogether the three boys save \$26 each month.

(a) Write down an equation in x.

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

(b) Solve your equation to find the amount Pavan saves each month.

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

---

11 Solve the simultaneous equations.
You must show all your working.

$$\tfrac{1}{2}x - 8y = 1$$
$$x + 2y = 6\tfrac{1}{2}$$

Answer x = ...

y = ... [3]

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12 The population of Olton is decreasing at a rate of 3% per year.
In 2013, the population was 50 000.

Calculate the population after 4 years.
Give your answer correct to the nearest hundred.

Answer ..... [3]

---

13 x varies directly as the cube root of y.
$x = 6$ when $y = 8$.

Find the value of x when $y = 64$.

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

---

14 Find the equation of the line that

- is perpendicular to the line $y = 3x - 1$

and

- passes through the point (7, 4).

Answer ..... [3]

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15 $\mathbf{A} = \begin{pmatrix} 8 & 3 \\ 4 & 2 \end{pmatrix}$

Find

(a) $\mathbf{A}^2$,

Answer(a) $\mathbf{A}^2 =$ $\begin{pmatrix} \quad & \quad \\ \quad & \quad \end{pmatrix}$ [2]

(b) $\mathbf{A}^{-1}$.

Answer(b) $\mathbf{A}^{-1} =$ $\begin{pmatrix} \quad & \quad \\ \quad & \quad \end{pmatrix}$ [2]

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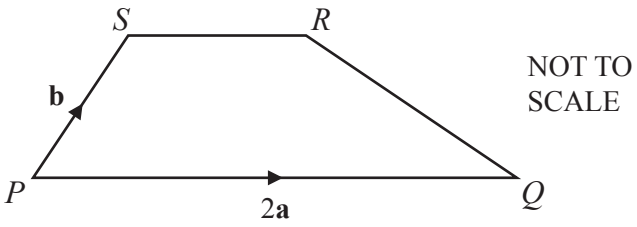
16 **Without using your calculator**, work out $2\frac{7}{9} \div \frac{5}{6}$.

Give your answer as a fraction in its lowest terms.
You must show each step of your working.

Answer ..... [4]

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17 (a)

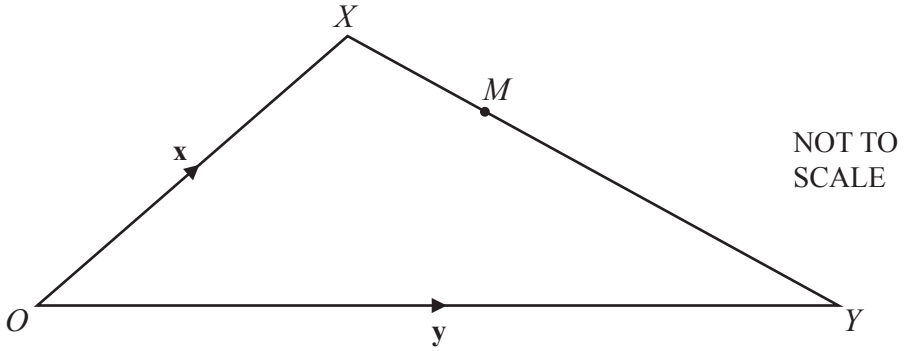


$PQRS$ is a trapezium with $PQ = 2SR$.
$\overrightarrow{PQ} = 2\mathbf{a}$ and $\overrightarrow{PS} = \mathbf{b}$.

Find $\overrightarrow{QR}$ in terms of **a** and **b** in its simplest form.

Answer(a) $\overrightarrow{QR}$ = ... [2]

(b)



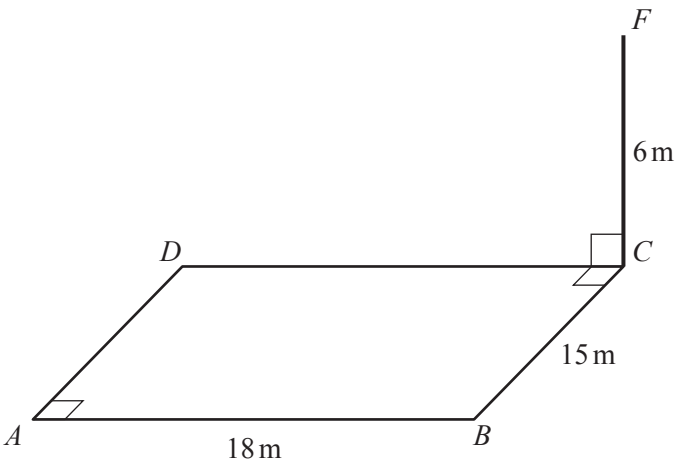
$\overrightarrow{OX} = \mathbf{x}$ and $\overrightarrow{OY} = \mathbf{y}$.
M is a point on XY such that $XM : MY = 3 : 5$.

Find $\overrightarrow{OM}$ in terms of **x** and **y** in its simplest form.

Answer(b) $\overrightarrow{OM}$ = ... [2]

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18



NOT TO SCALE

The diagram shows a rectangular playground $ABCD$ on horizontal ground.
A vertical flagpole CF, 6 metres high, stands in corner C.
$AB = 18$ m and $BC = 15$ m.

Calculate the angle of elevation of F from A.

Answer ..... [4]

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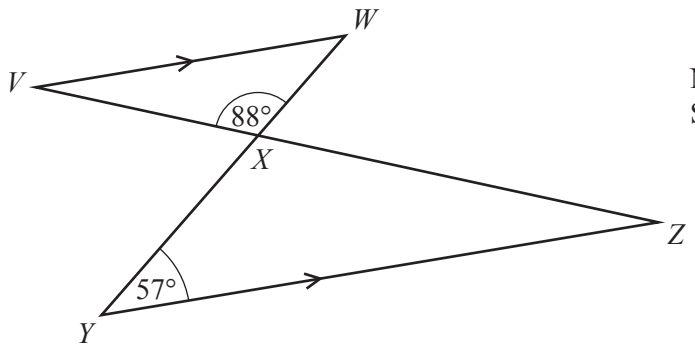
19 Fritz drives a distance of 381 km in 2 hours and 18 minutes.
He then drives 75 km at a constant speed of 30 km/h.

Calculate his average speed for the whole journey.

Answer ..... km/h [4]

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20 (a)



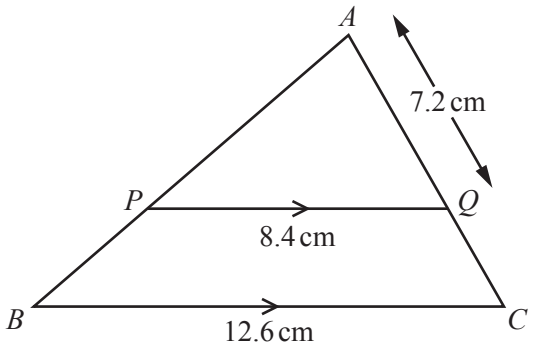
NOT TO SCALE

Two straight lines VZ and YW intersect at X.
VW is parallel to YZ, angle $XYZ = 57°$ and angle $VXW = 88°$.

Find angle WVX.

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

(b)



NOT TO SCALE

ABC is a triangle and PQ is parallel to BC.
$BC = 12.6$ cm, $PQ = 8.4$ cm and $AQ = 7.2$ cm.

Find AC.

Answer(b) AC = ... cm [2]

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21 **(a)** Simplify

(i) x^0,

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

(ii) $m^4 \times m^3$,

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

(iii) $(8p^6)^{\frac{1}{3}}$.

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

(b) $243^x = 3^2$

Find the value of x.

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

Question 22 is printed on the next page.

22 $f(x) = 5x - 3$ $g(x) = x^2$

(a) Find $fg(-2)$.

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

(b) Find $gf(x)$, in terms of x, in its simplest form.

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

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

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

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