Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

0067995524

MATHEMATICS **0580/22**

Paper 2 (Extended) **February/March 2018**

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.

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

CAMBRIDGE International Examinations

1 "We eat more ice cream as the temperature rises."

What type of correlation is this?

..... [1]

2 Write 0.000 052 3 in standard form.

..... [1]

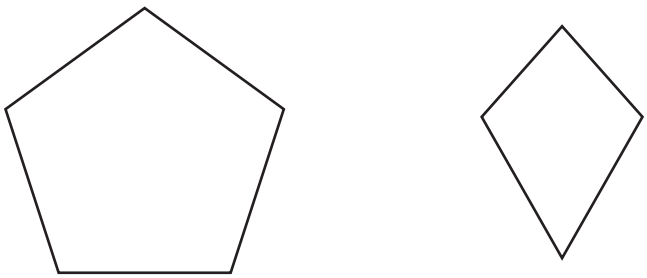
3 Calculate $\sqrt{17.8} - 1.3^{2.5}$.

..... [1]

4 Write the recurring decimal $0.\dot{8}$ as a fraction.

..... [1]

5



The diagram shows a regular pentagon and a kite.

Complete the following statements.

(a) The regular pentagon has ..... lines of symmetry. [1]

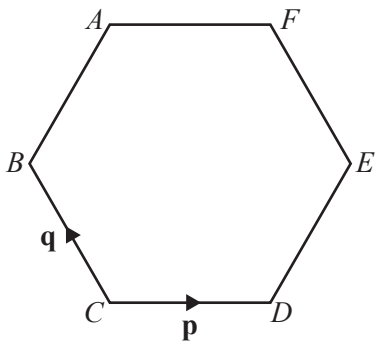
(b) The kite has rotational symmetry of order ..... . [1]

6 Factorise completely.

$$15k^2m - 20m^4$$

..... [2]

7



The diagram shows a regular hexagon $ABCDEF$.
$\overrightarrow{CD} = \mathbf{p}$ and $\overrightarrow{CB} = \mathbf{q}$.

Find $\overrightarrow{CA}$, in terms of **p** and **q**, giving your answer in its simplest form.

$\overrightarrow{CA}$ = ... [2]

8 Newton has a population of 23 000.
The population decreases exponentially at a rate of 1.4% per year.

Calculate the population of Newton after 5 years.

..... [2]

9 $2^p = \frac{1}{8^4}$

Find the value of p.

$p =$ ..... [2]

10 y is inversely proportional to x.
When $x = 9$, $y = 8$.

Find y when $x = 6$.

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

11 Dev makes 600 cakes.
18% of the 600 cakes go to a hotel and $\frac{2}{3}$ of the 600 cakes go to a supermarket.

Calculate how many cakes he has left.

..... [3]

12 **Without using your calculator**, work out $\frac{7}{8}+\frac{1}{6}$.

You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

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

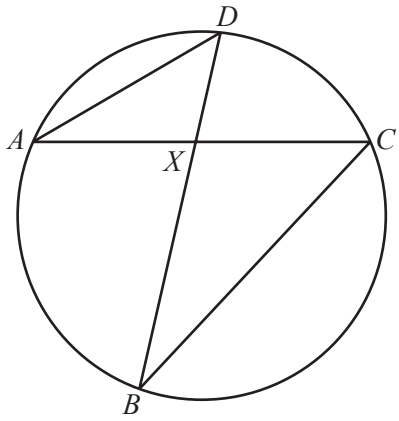
$$2x+\frac{1}{2}y=13$$
$$3x+2y=17$$

$x =$ .....

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

[Turn over

14



NOT TO SCALE

A, B, C and D are points on the circumference of the circle.
AC and BD intersect at X.

(a) Complete the statement.

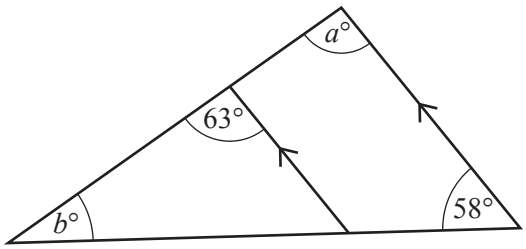
Triangle ADX is ..... to triangle BCX. [1]

(b) The area of triangle ADX is $36\,cm^2$ and the area of triangle BCX is $65.61\,cm^2$.
$AX = 8.6\,cm$ and $DX = 7.2\,cm$.

Find BX.

$BX =$ ..... cm [3]

15



NOT TO SCALE

Complete the statements.

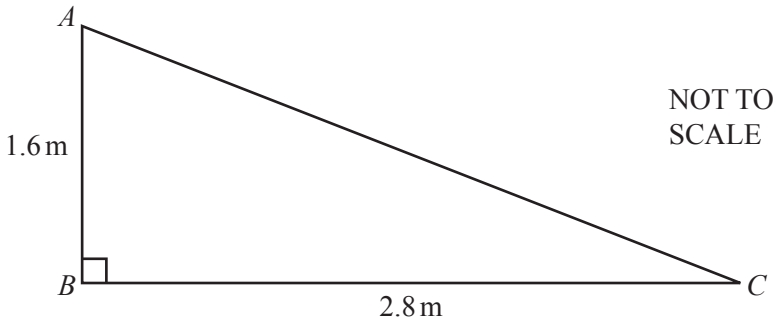
$a =$ ..... because .....

.....

$b =$ ..... because .....

..... [4]

16



(a) Find the area of triangle ABC.

..... m^2 [2]

(b) Calculate AC.

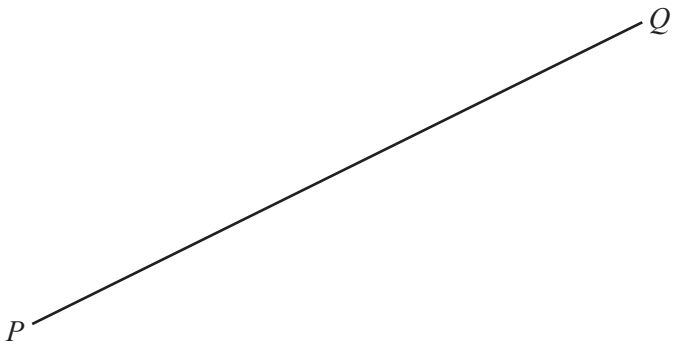
$AC =$ ..... m [2]

17 Solve the equation $2x^2 + 7x - 3 = 0$.
Show all your working and give your answers correct to 2 decimal places.

$x =$ ..... or $x =$ ..... [4]

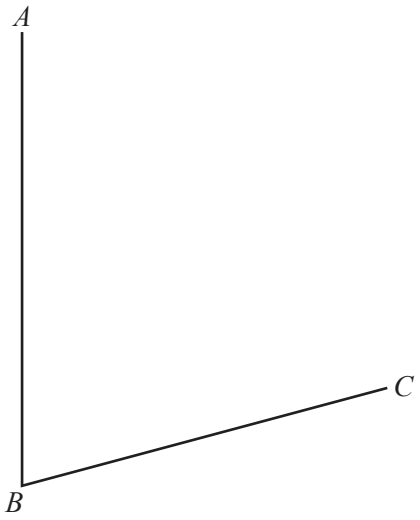
18 In this question, **use a straight edge and compasses only** and show all your construction arcs.

(a) Construct the perpendicular bisector of PQ.



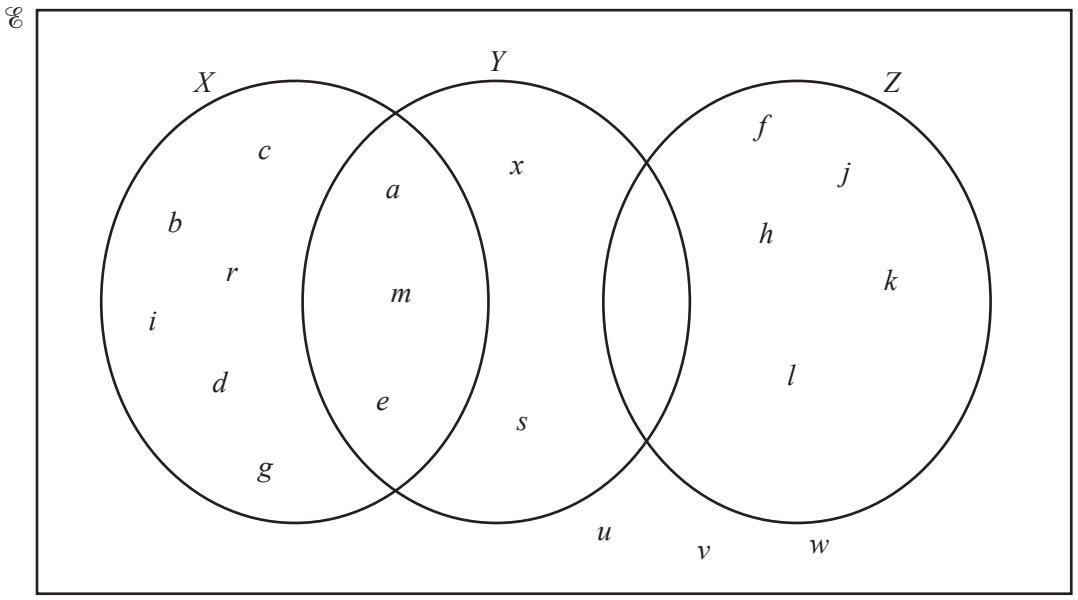
[2]

(b) Construct the bisector of angle ABC.



[2]

19



(a) Use set notation to complete the statements for the Venn diagram above.

(i) c ..... X [1]

(ii) ..... $= \{ a, m, e \}$ [1]

(iii) $Y \cap Z =$ ..... [1]

(b) List the elements of $(X \cup Y \cup Z)'$.

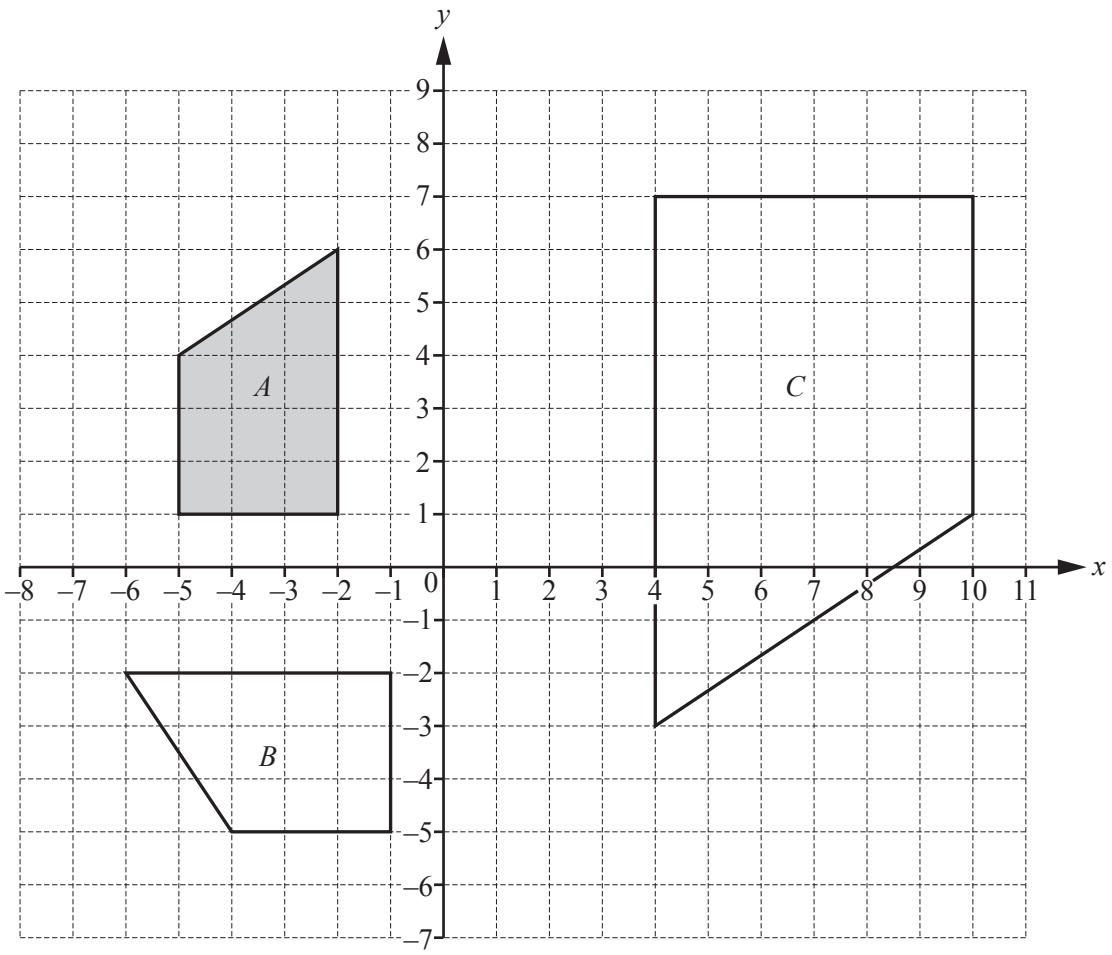
..... [1]

(c) Find $\mathrm{n}(X' \cap Z)$.

..... [1]

[Turn over

20



Describe fully the **single** transformation that maps

(a) shape *A* onto shape *B*,

.....

..... [3]

(b) shape *A* onto shape *C*.

.....

..... [3]

21 $f(x) = 7 - x$ $g(x) = 4x + 2$ $h(x) = 15 - x^2$

(a) Find $ff(2)$.

..... [2]

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

..... [2]

(c) Find $h(2x)$ in its simplest form.

..... [2]

Question 22 is printed on the next page.

22 Samira and Sonia each have a bag containing 20 sweets.
In each bag, there are 5 red, 6 green and 9 yellow sweets.

(a) Samira chooses one sweet at random from her bag.

Write down the probability that she chooses a yellow sweet.

..... [1]

(b) Sonia chooses two sweets at random, without replacement, from her bag.

(i) Show that the probability that she chooses two green sweets is $\frac{3}{38}$.

[2]

(ii) Calculate the probability that the sweets she chooses are **not** both the same colour.

..... [4]