

CANDIDATE  
NAME

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CENTRE  
NUMBER

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CANDIDATE  
NUMBER

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**MATHEMATICS**

**0580/22**

Paper 2 (Extended)

**May/June 2017**

**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  $\pi$ , 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.

1 Write 0.071 64 correct to 2 significant figures.

..... [1]

2 The probability that Stephanie wins her next tennis match is 0.85 .

Find the probability that Stephanie does not win her next tennis match.

..... [1]

3 Change  $6200 \text{ cm}^2$  into  $\text{m}^2$ .

.....  $\text{m}^2$  [1]

4 Calculate  $\sqrt{120} + 3.8^2 - 25$ .

..... [1]

5 Work out 85 cents as a percentage of \$2.03 .

..... % [1]

6 Factorise.

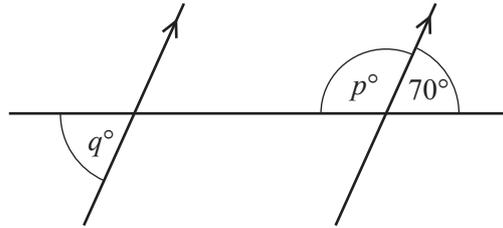
$$14x - 21y$$

..... [1]

7 Find the value of  $5a - 3b$  when  $a = 7$  and  $b = -2$ .

..... [2]

8



NOT TO SCALE

The diagram shows a straight line intersecting two parallel lines.

Find the value of  $p$  and the value of  $q$ .

$p =$  .....

$q =$  ..... [2]

9 Without using a calculator, work out  $\frac{5}{6} - \frac{1}{2}$ .

Show all the steps of your working and give your answer as a fraction in its simplest form.

..... [2]

10 Solve.

$$2 - x = 5x + 1$$

$$x = \dots\dots\dots [2]$$

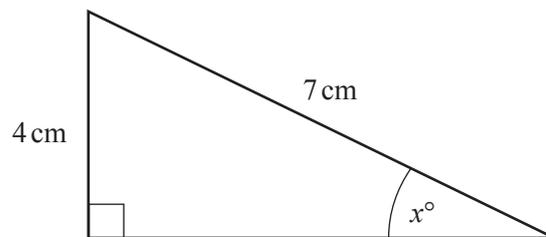
11 (a) Write 0.0605 in standard form.

..... [1]

(b) Calculate  $0.1 \times 5.1 \times 10^4$ , giving your answer in standard form.

..... [1]

12



NOT TO  
SCALE

Calculate the value of  $x$ .

$$x = \dots\dots\dots [2]$$

13 Solve the inequality.

$$3n - 11 > 5n - 18$$

..... [2]

14 Work out.

(a)  $125^{\frac{2}{3}}$

..... [1]

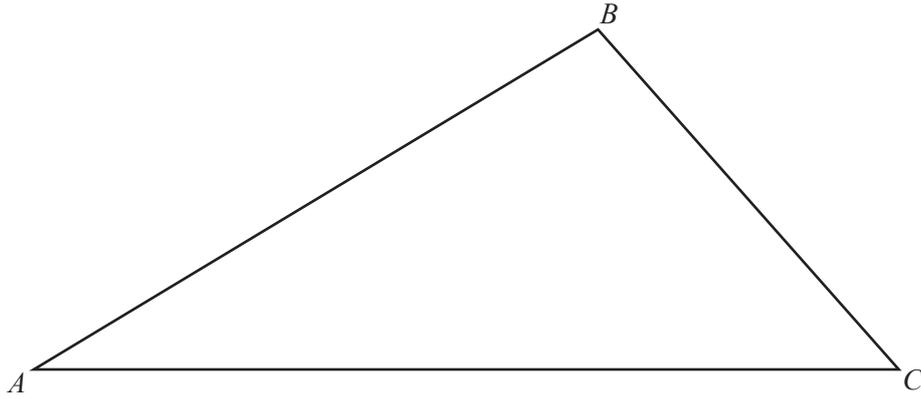
(b)  $\left(\frac{1}{3}\right)^{-2}$

..... [1]

15 Make  $q$  the subject of the formula  $p = 2q^2$ .

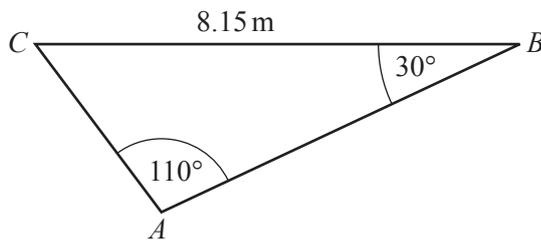
$q =$  ..... [2]

16



- (a) Using a straight edge and compasses only, construct the bisector of angle  $BAC$ . [2]
- (b) Shade the region inside the triangle that is nearer to  $AC$  than to  $AB$ . [1]

17

NOT TO  
SCALECalculate  $AC$ . $AC = \dots\dots\dots$  m [3]

- 18 A rectangle has length 62 mm and width 47 mm, both correct to the nearest millimetre.  
The area of this rectangle is  $A \text{ mm}^2$ .

Complete the statement about the value of  $A$ .

$$\dots\dots\dots \leq A < \dots\dots\dots [3]$$

- 19 In a triangle  $PQR$ ,  $PQ = 8 \text{ cm}$  and  $QR = 7 \text{ cm}$ .  
The area of this triangle is  $17 \text{ cm}^2$ .

Calculate the two possible values of angle  $PQR$ .

$$\text{Angle } PQR = \dots\dots\dots \text{ or } \dots\dots\dots [3]$$

- 20 Write as a single fraction in its simplest form.

$$\frac{2x-1}{3} - \frac{2}{x+1}$$

$$\dots\dots\dots [3]$$

- 21  $y$  is inversely proportional to  $\sqrt{1+x}$ .  
When  $x = 8$ ,  $y = 2$ .

Find  $y$  when  $x = 15$ .

$$y = \dots\dots\dots [3]$$

- 22 Factorise completely.

(a)  $9t^2 - u^2$

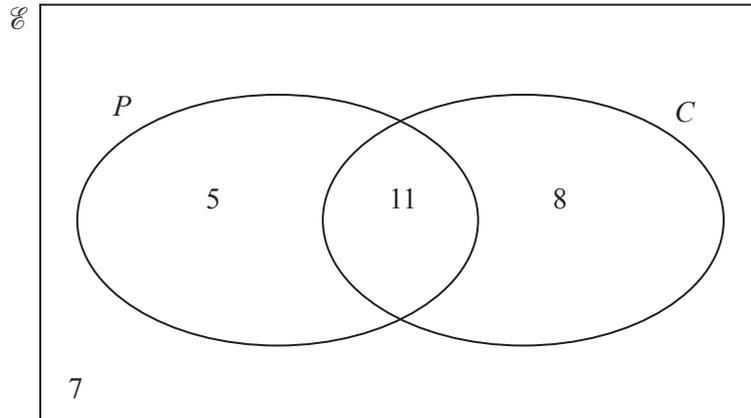
$$\dots\dots\dots [2]$$

(b)  $2c - 4d - pc + 2pd$

$$\dots\dots\dots [2]$$

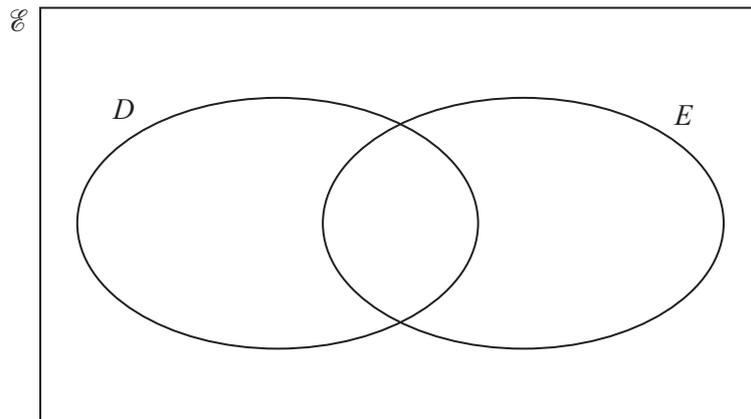
- 23 (a)  $\mathcal{E} = \{\text{students in a class}\}$   
 $P = \{\text{students who study physics}\}$   
 $C = \{\text{students who study chemistry}\}$

The Venn diagram shows numbers of students.

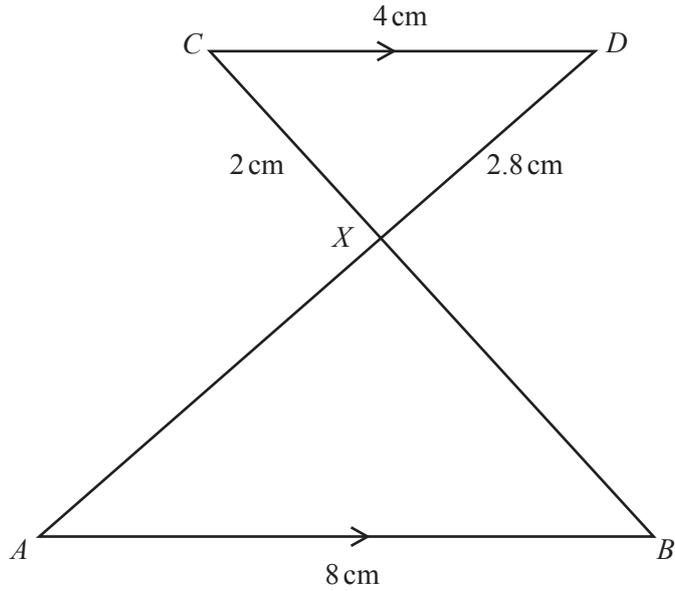


- (i) Find the number of students who study physics or chemistry.  
 ..... [1]
- (ii) Find  $n(P \cap C')$ .  
 ..... [1]
- (iii) A student who does not study chemistry is chosen at random.  
 Find the probability that this student does not study physics.  
 ..... [1]

- (b) On the Venn diagram below, shade the region  $D \cup E'$ .



[1]



NOT TO SCALE

In the diagram,  $AB$  and  $CD$  are parallel.  
 $AD$  and  $BC$  intersect at  $X$ .  
 $AB = 8$  cm,  $CD = 4$  cm,  $CX = 2$  cm and  $DX = 2.8$  cm.

(a) Complete this mathematical statement.

Triangle  $ABX$  is ..... to triangle  $DCX$ . [1]

(b) Calculate  $AX$ .

$AX =$  ..... cm [2]

(c) The area of triangle  $ABX$  is  $y$  cm<sup>2</sup>.

Find the area of triangle  $DCX$  in terms of  $y$ .

..... cm<sup>2</sup> [1]

25 (a) Simplify.  $(16x^{16})^{\frac{3}{4}}$

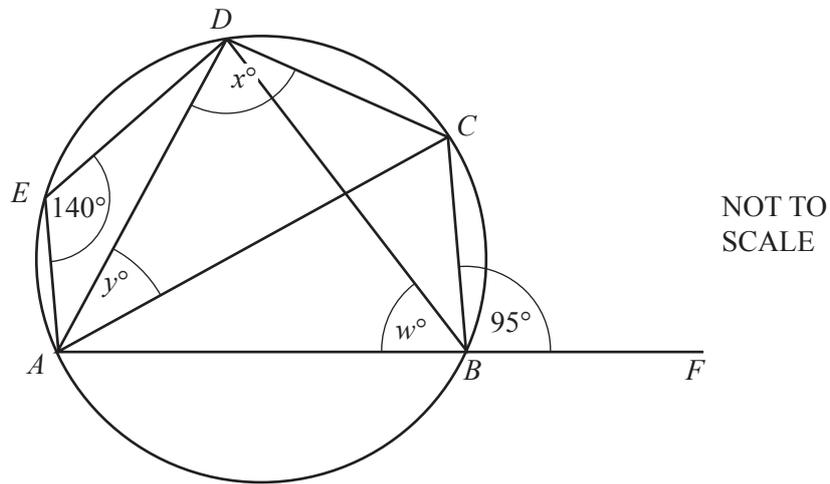
..... [2]

(b)  $2p^{\frac{3}{2}} = 54$

Find the value of  $p$ .

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

26

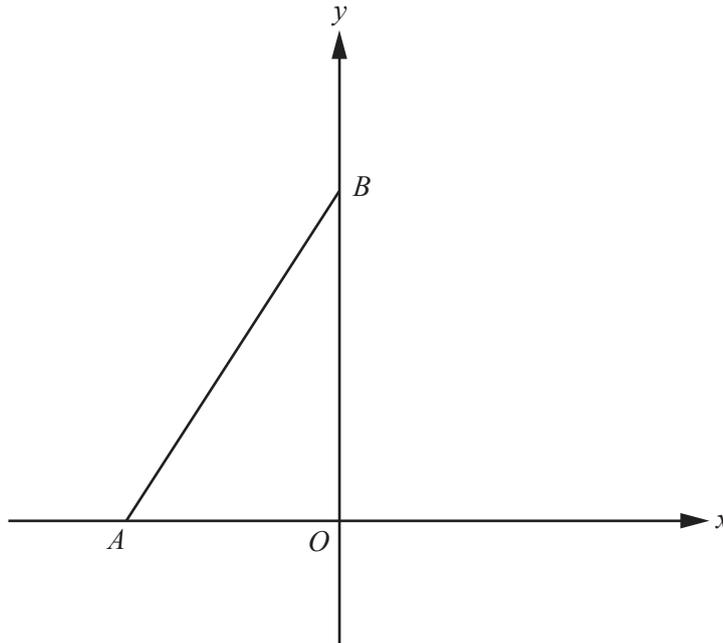


$A, B, C, D$  and  $E$  lie on the circle.  
 $AB$  is extended to  $F$ .  
 Angle  $AED = 140^\circ$  and angle  $CBF = 95^\circ$ .

Find the values of  $w, x$  and  $y$ .

$w =$  .....  
 $x =$  .....  
 $y =$  ..... [5]

**Question 27 is printed on the next page.**



NOT TO SCALE

$A$  is the point  $(-2, 0)$  and  $B$  is the point  $(0, 4)$ .

(a) Find the equation of the straight line joining  $A$  and  $B$ .

..... [3]

(b) Find the equation of the perpendicular bisector of  $AB$ .

..... [4]

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