

Please check the examination details below before entering your candidate information


Candidate surname					Other names				
Centre Number				Candidate Number					
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**Pearson Edexcel Level 1/Level 2 GCSE (9–1)**

**Friday 19 May 2023**

Morning (Time: 1 hour 30 minutes)      Paper reference **1MA1/1H**

**Mathematics**  
**PAPER 1 (Non-Calculator)**  
**Higher Tier**  
**Shadow Set 1**



**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, Formulae Sheet (enclosed). Tracing paper may be used.

Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may not be used.**

### Information

- The total mark for this paper is 80.
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*

### Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

**Answer ALL questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

**1** Work out  $4.62 \div 0.12$

.....  
**(Total for Question 1 is 3 marks)**

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2 Work out  $5\frac{3}{10} - 3\frac{2}{5}$

Give your answer as a mixed number.

.....  
**(Total for Question 2 is 3 marks)**

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3 A cube has a total volume of  $64 \text{ cm}^3$

Work out the surface of the cube.

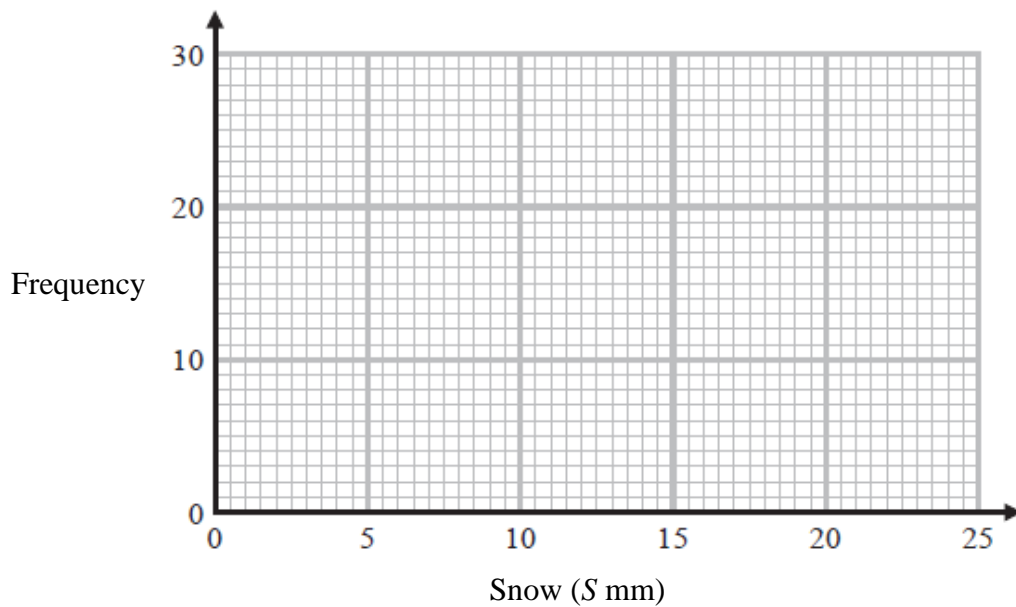
.....  $\text{cm}^2$   
**(Total for Question 3 is 4 marks)**

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- 4 The table shows information about the amount of snow, in mm, in a town for 70 days in winter.

Snow ( $S$ mm)	Frequency
$0 \leq S < 5$	2
$5 \leq S < 10$	22
$10 \leq S < 15$	17
$15 \leq S < 20$	14
$20 \leq S < 25$	9

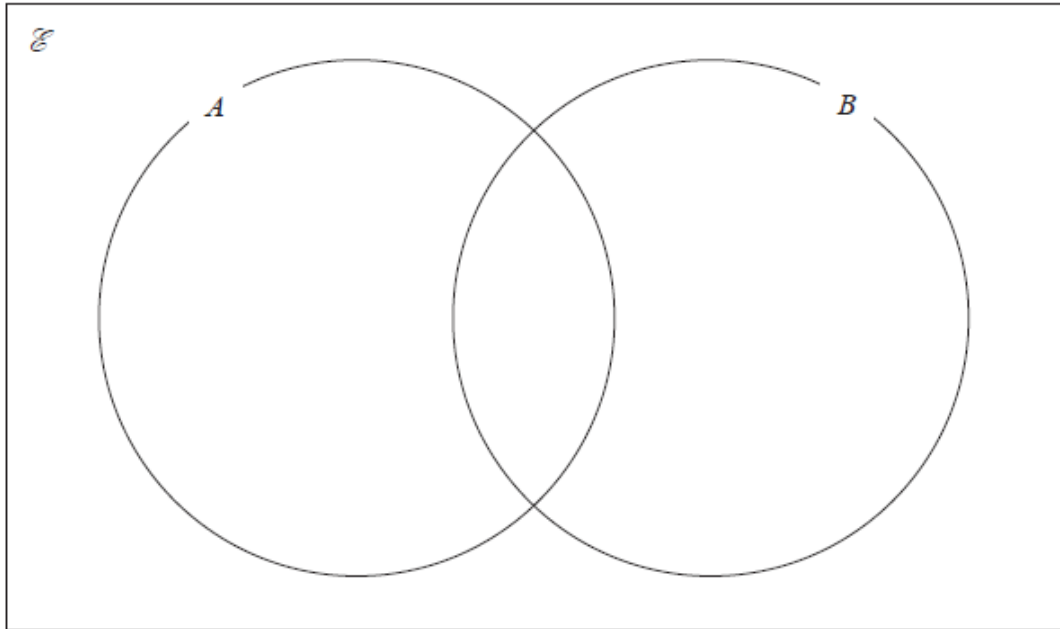
Draw a frequency polygon for this information.



(Total for Question 4 is 2 marks)

- 5  $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$   
 $A = \{\text{even numbers}\}$   
 $B = \{\text{square numbers}\}$

(a) Complete the Venn diagram for this information.



(3)

A number is chosen at random from the universal set  $\mathcal{E}$ .

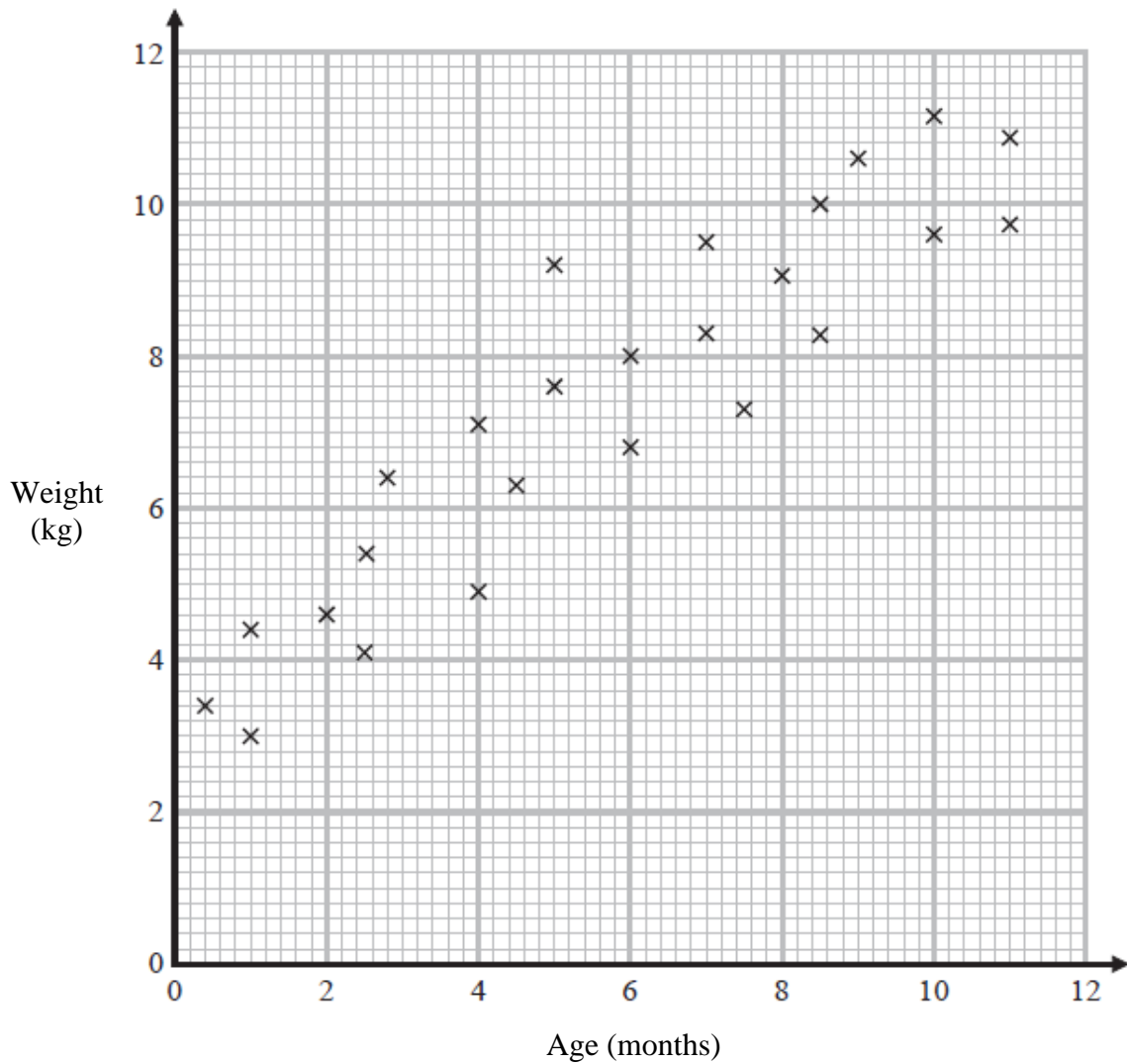
(b) Find the probability that this number is in the set  $A'$

.....  
(2)

**(Total for Question 5 is 5 marks)**

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6 The scatter graph shows information about the ages and weights of some newborn monkeys.



(a) Describe the relationship between the age and the weight of the monkeys.

.....

.....

.....

**(1)**

Another monkey has a weight of 8.4 kg

(b) Using the scatter graph, find an estimate for the age of this monkey.

..... months

**(2)**

**(Total for Question 6 is 3 marks)**

- 7 The price of a console increases by 15%  
This 15% increase adds £375 to the price of the console.

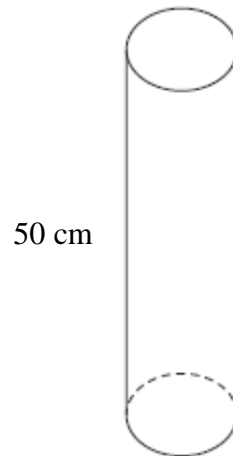
Work out the price of the console before the increase.

£.....

**(Total for Question 7 is 2 marks)**

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8 The diagram shows a solid cylinder on a horizontal floor.



$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

The cylinder has a

volume of  $1500 \text{ cm}^3$   
height of  $50 \text{ cm}$ .

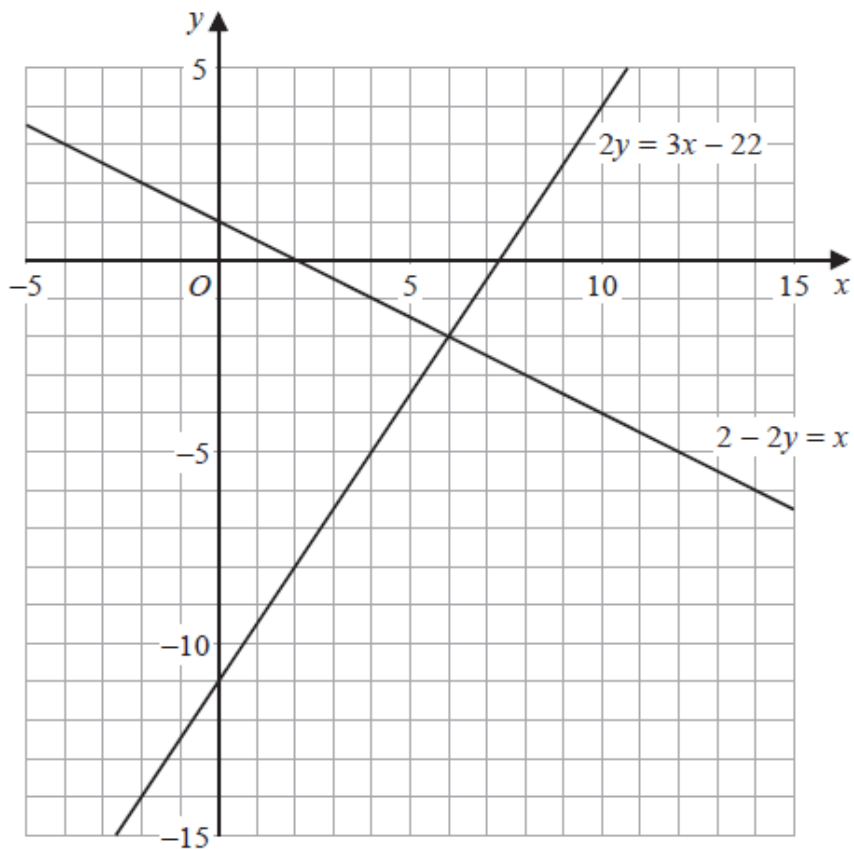
The cylinder exerts a force of  $120 \text{ newtons}$  on the floor.  
Work out the pressure on the floor due to the cylinder.

..... newtons/cm<sup>2</sup>

**(Total for Question 8 is 3 marks)**



9



Use these graphs to solve the simultaneous equations

$$2y = 3x - 22$$

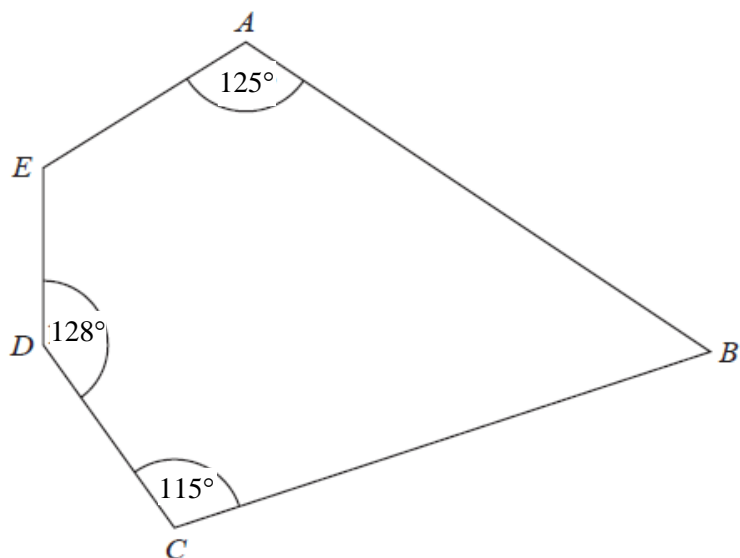
$$2 - 2y = x$$

$x =$  .....

$y =$  .....

**(Total for Question 9 is 1 mark)**

10 Here is a pentagon.



Angle  $AED = 3 \times$  angle  $ABC$

Work out the size of angle  $AED$ .  
You must show all your working.

..... °  
**(Total for Question 10 is 4 marks)**

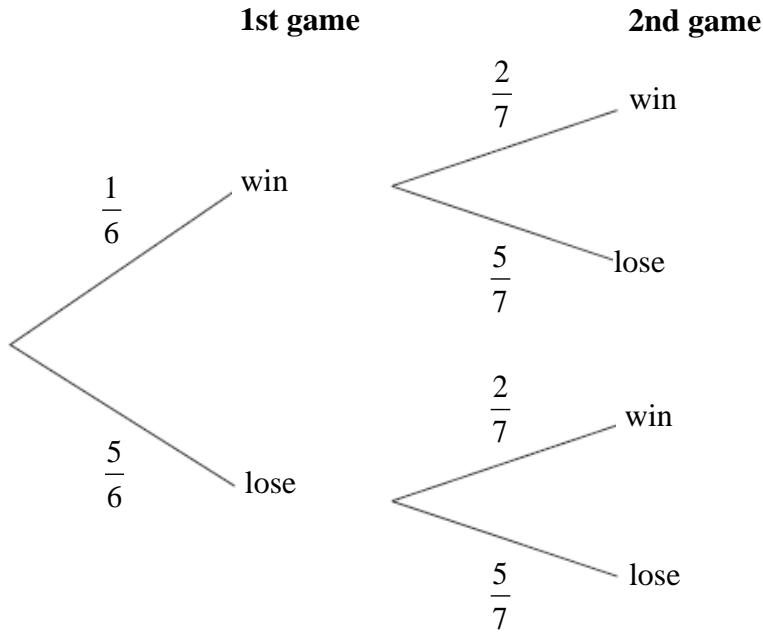
- 11 Write  $\frac{(10x^6y^4)^2}{4x^2y^5 \times 5xy^{-4}}$  in the form  $ax^by^c$  where  $a$ ,  $b$  and  $c$  are integers.

.....  
**(Total for Question 11 is 3 marks)**

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12 Malcolm plays two games of tennis.

The probability tree diagram shows the probabilities that Malcolm will win or lose each game.



Find the probability that Malcolm will win at least one game.

.....  
**(Total for Question 12 is 3 marks)**

- 13**  $y$  is directly proportional to  $x$ .  
 $y = 36$  when  $x = 1.2$   
Work out the value of  $y$  when  $x = 4$

$y = \dots\dots\dots$

**(Total for Question 13 is 3 marks)**

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- 14** (a) Write  $\frac{1}{81}$  in the form  $3^n$  where  $n$  is an integer.

$\dots\dots\dots$  **(1)**

- (b) Work out the value of  $27^{\frac{4}{3}} - 16^{\frac{3}{2}}$

$\dots\dots\dots$  **(3)**

**(Total for Question 14 is 4 marks)**

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- 15** The equation of line  $L_1$  is  $y = 3x - 5$   
The equation of line  $L_2$  is  $4y + kx - 20 = 0$

$L_1$  is perpendicular to  $L_2$

Find the value of  $k$ .

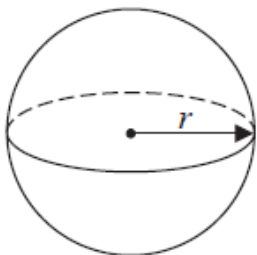
You must show all your working.

$k = \dots\dots\dots$

**(Total for Question 15 is 3 marks)**

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16 Here is a sphere.



Surface area of sphere = $4\pi r^2$
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$\frac{5}{8}$  of the surface area of this sphere is  $375\pi \text{ cm}^2$

Find the diameter of the sphere.

Give your answer in the form  $a\sqrt{b}$  where both  $a$  and  $b$  are integers.

..... cm

**(Total for Question 16 is 4 marks)**

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17 Make  $x$  the subject of the formula  $y = \frac{5(3x-2)}{7x+4}$

.....  
**(Total for Question 17 is 4 marks)**

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18 8 kg of aubergines and 3 kg of radishes cost a total of £28

cost of 1 kg of aubergines : cost of 1 kg of radishes = 1 : 2

Work out the cost of 1 kg of aubergines and the cost of 1 kg of radishes.

aubergines £.....

radishes £.....

**(Total for Question 18 is 4 marks)**

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**19** A tailor's shop sells jackets, shirts and pairs of shoes.

The shop sells 7 varieties of jackets.

The shop sells  $x$  varieties of shirt.

The shop sells 3 varieties of pairs shoes.

There are 231 different ways to choose one jacket, one shirt and one pair of shoes.

Work out the value of  $x$ .

$x = \dots\dots\dots$

**(Total for Question 19 is 2 marks)**

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**20** For  $x \geq 0$ , the functions  $f$  and  $g$  are such that

$$f(x) = 2x - 6 \qquad g(x) = \frac{2\sqrt{x}}{3} + 7$$

(a) Find  $g^{-1}(x)$

$$g^{-1}(x) = \dots\dots\dots \quad (2)$$

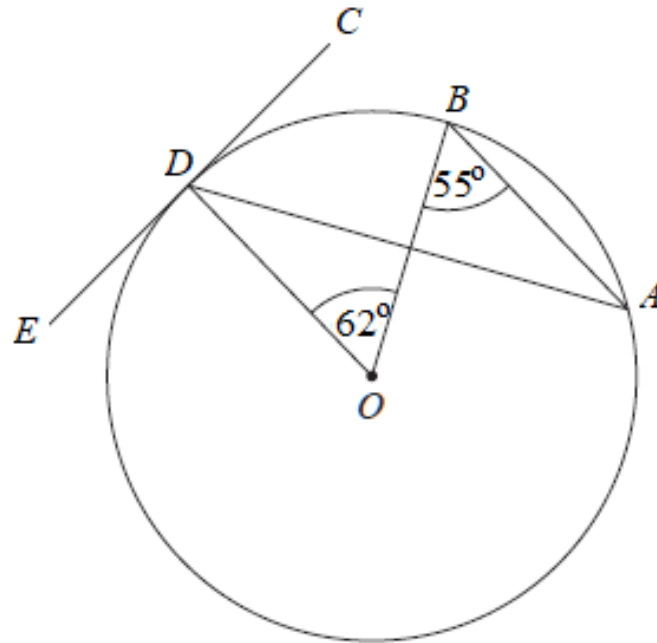
(b) Solve  $gf(x) = 15$

$$x = \dots\dots\dots \quad (3)$$

**(Total for Question 20 is 5 marks)**

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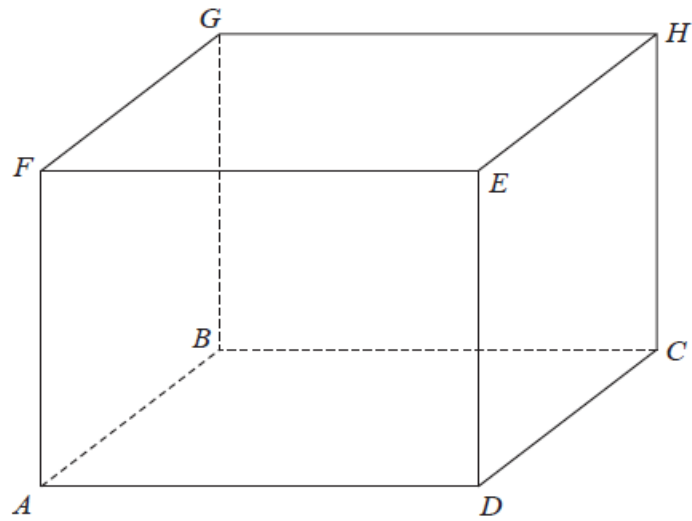
- 21  $A$ ,  $B$  and  $D$  are points on a circle with centre  $O$ .  
 $CDE$  is the tangent to the circle at  $D$ .



Work out the size of angle  $ADC$ .  
 Write down any circle theorems you use.

.....<sup>o</sup>  
**(Total for Question 21 is 4 marks)**

22  $ABCDEFGH$  is a cuboid.



$ED = 5.9$  cm  
 $BE = 11.8$  cm

Work out the size of the angle between  $BE$  and the plane  $ABCD$ .

..... °  
**(Total for Question 22 is 2 marks)**

23 Write  $\frac{3\sqrt{5}}{4-\sqrt{5}} - \frac{2}{\sqrt{5}}$  in the form  $\frac{a\sqrt{5}+b}{c}$  where  $a, b$  and  $c$  are integers.

.....  
**(Total for Question 23 is 4 marks)**

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**24** Find the set of possible values of  $x$  for which

$$9x^2 - 36 < 0 \quad \mathbf{and} \quad 20 - 7x - 3x^2 > 0$$

You must show all your working.

.....  
**(Total for Question 24 is 5 marks)**

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**TOTAL FOR PAPER IS 80 MARKS**