Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

EDEXCEL Mock Test Papers

paper3 -Test1

Mathematics
PAPER 3 (Calculator)
Higher Tier

3H

Morning (Time: 1 hour 30 minutes)

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator, 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 be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

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.
- 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 (a) Simplify $(p^2)^6$

.....

(1)

(b) Simplify $x^5 \times x^6$

.....

(1)

(c) Expand $3q(q^2 + 2q)$

.....

(2)

(Total for Question 1 is 4 marks)

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2 Mia is hosting a party for 1200 people.

Each person who drinks tea will drink 4 cups of tea.

7.2 g of tea is needed for each cup of tea.

Mia assumes that 50% of the people will drink tea.

(a) Using this assumption, calculate the total amount of tea Mia needs.

Give your answer correct to the nearest gram.

..... g
(4)

Mia's assumption is wrong.
55% of the people will drink tea.

(b) How does this affect your answer to part (a)?

.....

.....

.....

(1)

(Total for Question 2 is 5 marks)

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3 Line A passes through the points (3, 6) and (5, -2)
Line B passes through the points (2, 5) and (8, k)

Line A and Line B are parallel.

Find the value of k.

k=.....

(Total for Question 3 is 4 marks)

4 It takes 10 hours for 6 identical air conditioners to cool a room.

How many hours would it take for 4 of these air conditioners to cool another room of the same size?

..... hours

(Total for Question 4 is 2 marks)

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5 A and B are numbers such that

$$A = 2^3 \times 5^2 \times 7$$
$$B = 2^2 \times 5 \times 7^3$$

(a) Find the highest common factor (HCF) of A and B

.....

(1)

(b) Find the lowest common multiple (LCM) of A and B

.....

(2)

(Total for Question 5 is 3 marks)

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6 A film starts at 6.45 pm.
The film lasts 150 minutes.
What time does the film finish?

.....

(Total for Question 6 is 2 marks)

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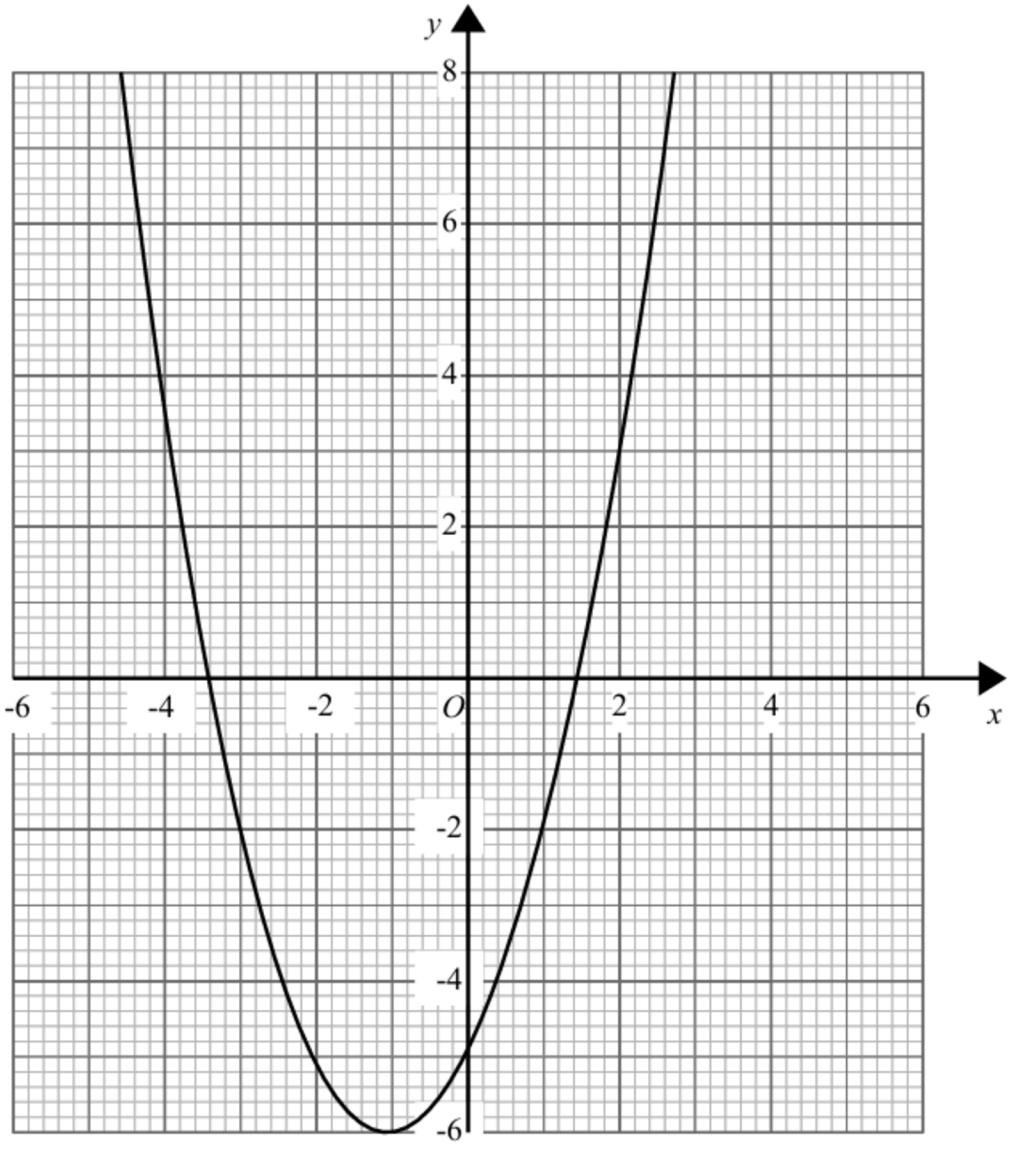
7 Here is the graph of $y = x^2 + 2x - 5$



(a) Write down the turning point of the graph $y = x^2 + 2x - 5$

(..... , ...)

(1)

(b) Use the graph to find the roots of the equation $x^2 + 2x - 5 = 2$

.....

(2)

(Total for Question 7 is 3 marks)

8 A solid cube is made of plastic.
The plastic has a density of 5 g/cm^3.
The volume of the cube is 125 cm^3.
Work out the mass of the cube.

..... g

(Total for Question 8 is 2 marks)

9 A survey was conducted to ask people if they wanted a new smartphone.
60% of the people said yes.
75% of the people who said yes wanted a smartphone with a large screen.
What percentage of the people asked said they wanted a smartphone with a large screen?

..... %

(Total for Question 9 is 2 marks)

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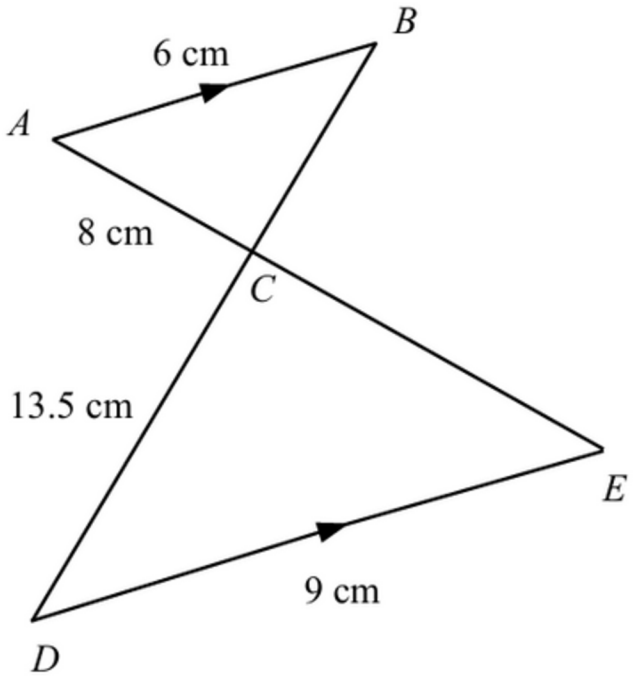
10



AB is parallel to DE.
ACE and BCD are straight lines.
AB = 6 cm,
AC = 8 cm,
CD = 13.5 cm,
DE = 9 cm.

(a) Calculate the length of BC.

..... cm

(b) Calculate the length of CE

..... cm

(Total for Question 10 is 3 marks)

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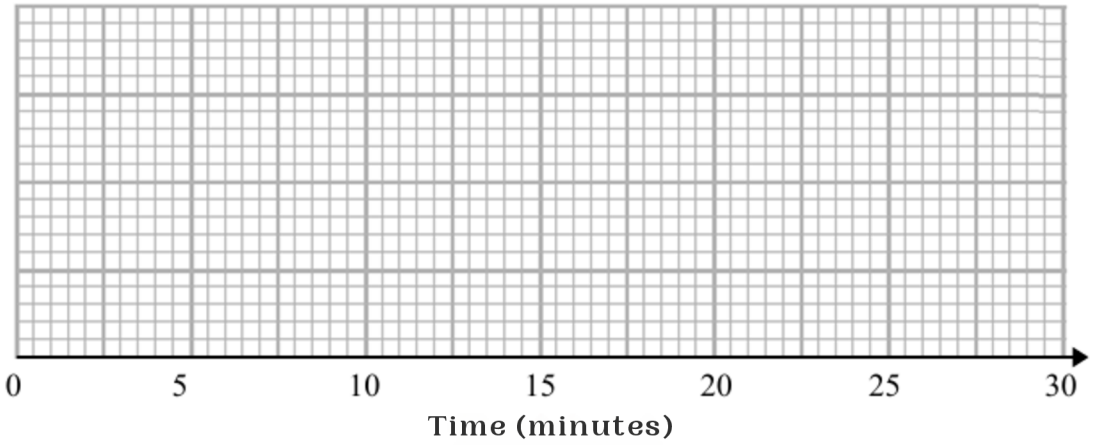
11 The table shows some information about times, in minutes, it took some boys to complete a puzzle.

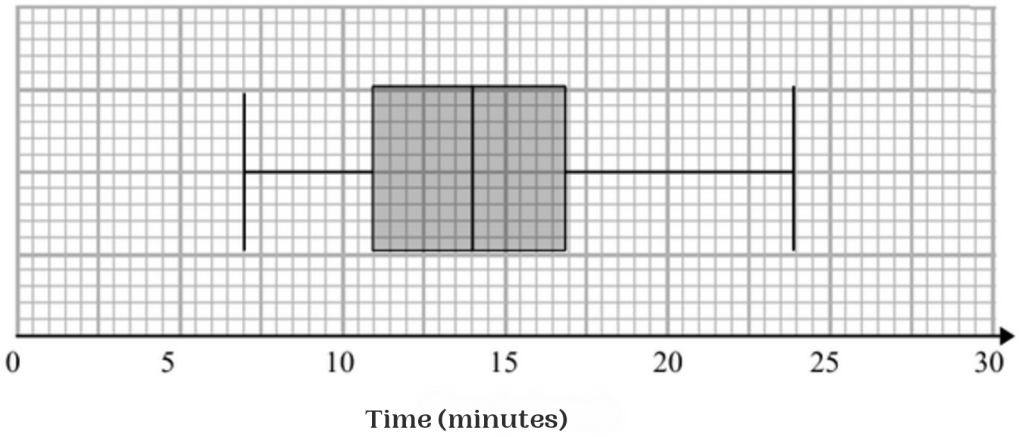
Inter Quartile Range	Minimum	Median	Upper Quartile	Maximum
8	12	18	23	29

(a) Draw a box plot for this information.



(3)

Some girls also completed the puzzle.
The box plot below shows the distribution of times the girls took to complete the puzzle.



(b) Compare the distribution of girls' times and the boys' times.

.....

.....

.....

(2)

(Total for Question 11 is 5 marks)

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12 Show that $(x - 2)(x + 4)(x - 6)$ can be written in the form $ax^3 + bx^2 + cx + d$ where a, b, c and d are integers.

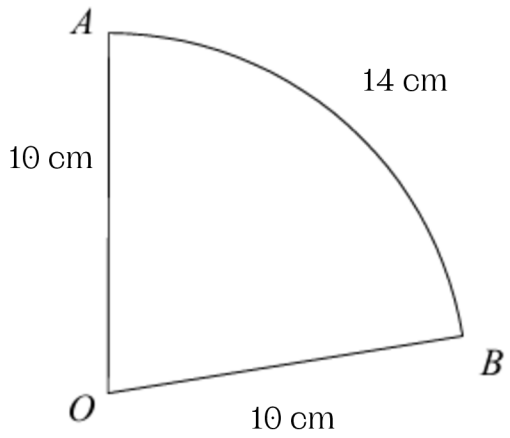
(Total for Question 12 is 3 marks)

13 The n-th term of the sequence of square numbers is given by: $S_n = n^2$

Prove that the difference between the square of any two consecutive integers is always an odd number.

(Total for Question 13 is 3 marks)

14 AOB is a sector of a circle, centre O and radius 10 cm.
The length of arc AB is 14 cm.



Find the area of the sector

..... cm^2

(Total for Question 14 is 4 marks)

15 (a) Factorise $x^2 - y^2$

.....

(1)

(b) Show that $399 - 1$ is the product of two consecutive even numbers.

(2)

(Total for Question 15 is 3 marks)

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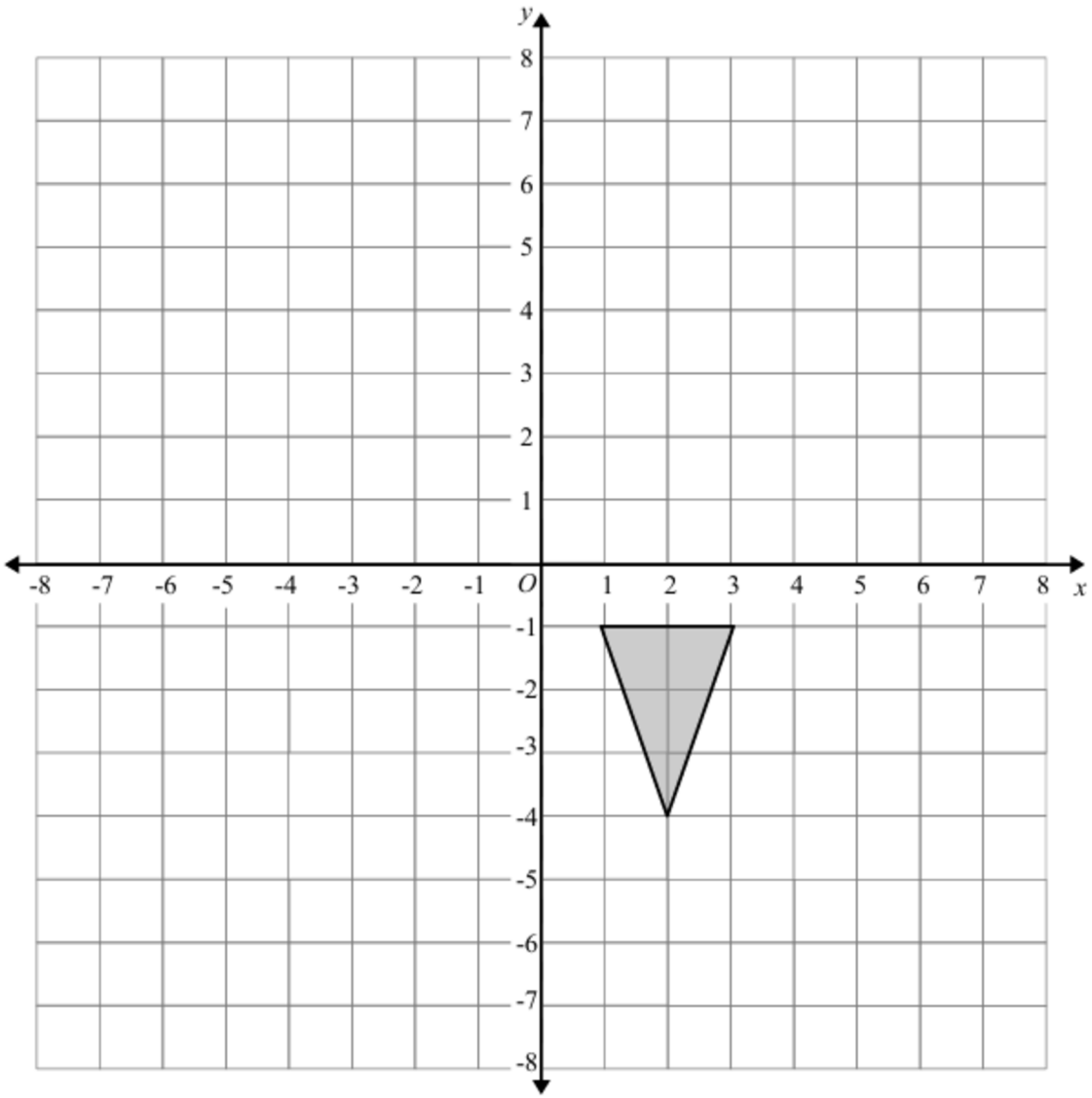
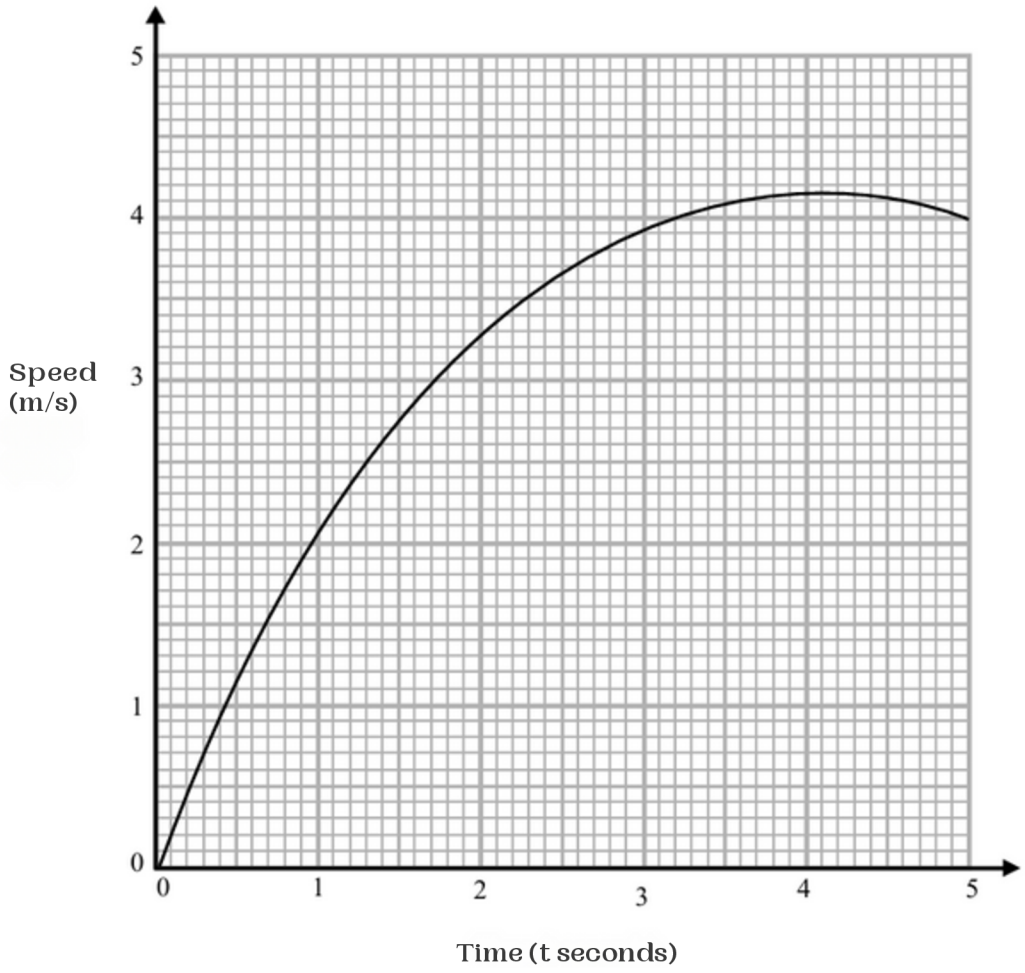
16



On the grid, enlarge the triangle by scale factor -2. centre O

(Total for Question 16 is 2 marks)

17 Here is a speed-time graph



(a) Use 3 strips of equal width to find an estimate for the area under the graph for the first 3 seconds.

.....

(3)

(b) Describe what your answer to part a represents.

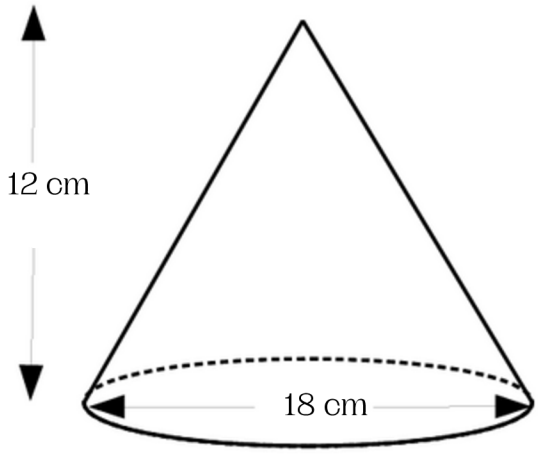
.....

.....

(1)

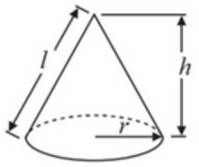
(Total for Question 17 is 4 marks)

18 The diagram shows a solid cone



Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi r l$

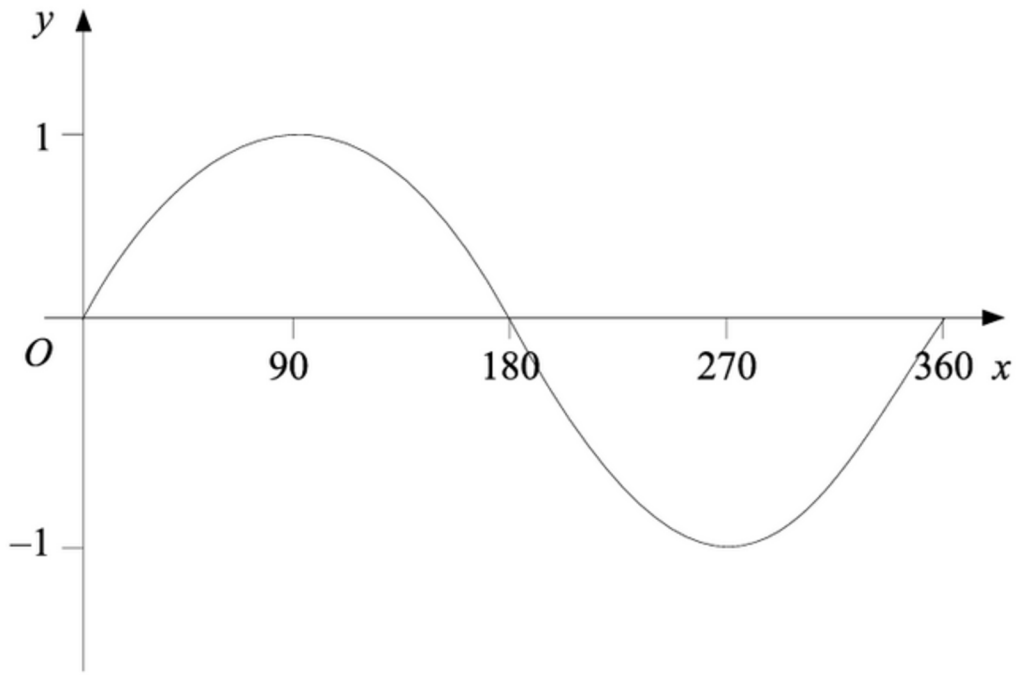


The height of the cone is 12 cm.
The base of the cone has a diameter of 18 cm.
Work out the total surface area of the cone.
Give your answer in terms of π.

..... cm2

(Total for Question 18 is 5 marks)

19 Here is a sketch of the curve $y = \sin x°$ for $0 \leq x \leq 360$



Given that $\sin 30° = 1/2$

write down the value of

i) $\sin 150°$

.....

ii) $\sin 330°$

.....

(Total for Question 19 is 2 marks)

20 Write $3.\dot{5}\dot{9}\dot{4}$ as a fraction in its simplest form

(Total for Question 20 is 3 marks)

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21 Solve $\frac{2}{5-x} + \frac{3}{x+7} = 1$

.....

(Total for Question 21 is 4 marks)

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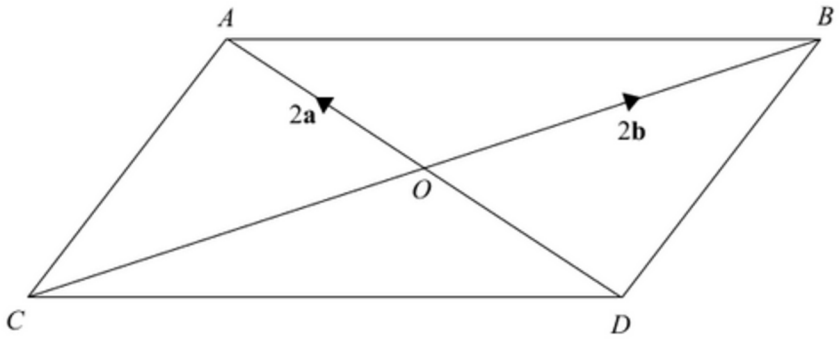
22 The diagram shows a parallelogram.



$\overrightarrow{OA} = 2\mathbf{a}$

$\overrightarrow{OB} = 2\mathbf{b}$

(a) Find, in terms of a, the vector $\overrightarrow{DA}$

.....

(1)

(b) Find, in terms of a and b, the vector $\overrightarrow{AB}$

.....

(1)

(c) Find, in terms of a and b, the vector $\overrightarrow{AC}$

.....

(1)

(Total for Question 22 is 3 marks)

23 A circle C has centre (2,5)

The point A (11, 8) lies on the circumference of the circle.

Find the equation of the tangent to the circle at A

(Total for Question 23 is 5 marks)

24 In a bag there are only red counters, blue counters, green counters and yellow counters.
A counter is taken at random from the bag.

The table shows the probabilities that the counter will be green or will be yellow.

Colour	Red	Blue	Green	Yellow
Probability			0.35	0.20

The probability that the counter will be red is twice the probability that the counter will be blue.
There are 21 green counters in the bag.
Work out the number of red counters in the bag.

.....

(Total for Question 24 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS