www.dynamicpapers.com

Please check the examination details below before entering your candidate infor on

Candidate surname | Other names

Centre Number | Candidate Number

Pearson Edexcel International GCSE

Wednesday 7 June 2023

Morning (Time: 2 hours)

Paper reference **4MA1/2H**

Mathematics A

PAPER 2H

Higher Tier



You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. 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.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators may be used.**
- You must **NOT** write anything on the formulae page.
- Anything you write on the formulae page will gain NO credit.

Information

- The total mark for this paper is 100.
- 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.
- Check your answers if you have time at the end.

Turn over ▶

P72828A

©2023 Pearson Education Ltd.

N:1/1/1/1/

P 7 2 8 2 8 A 0 1 2 8

Pearson

www.dynamicpapers.com

International GCSE Mathematics

Formulae sheet – Higher Tier

Arithmetic series

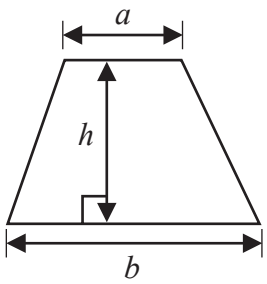
Sum to n terms, $S_n = \frac{n}{2}[2a + (n-1)d]$

The quadratic equation

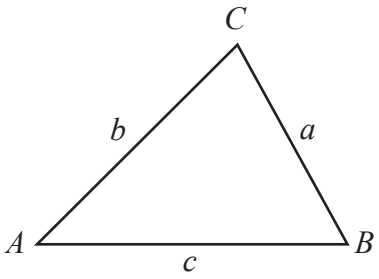
The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Area of trapezium $= \frac{1}{2}(a+b)h$



Trigonometry



In any triangle *ABC*

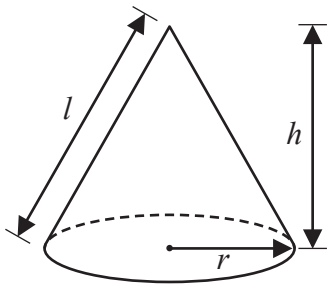
Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc\cos A$

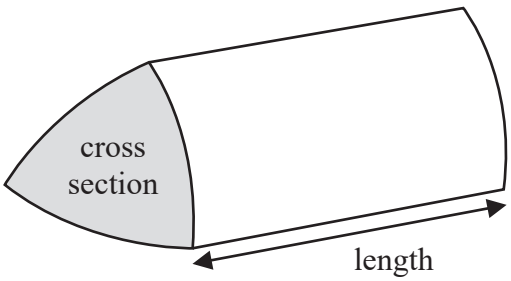
Area of triangle $= \frac{1}{2}ab\sin C$

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

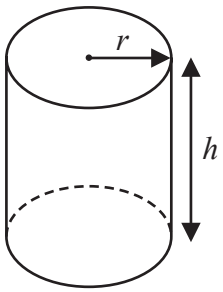
Curved surface area of cone $= \pi rl$



Volume of prism
= area of cross section × length

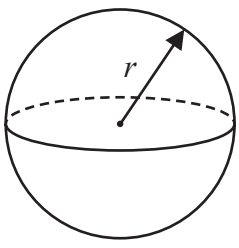


Volume of cylinder $= \pi r^2 h$
Curved surface area of cylinder $= 2\pi rh$



Volume of sphere $= \frac{4}{3}\pi r^3$

Surface area of sphere $= 4\pi r^2$



DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

www.dynamicpapers.com

Answer ALL TWENTY FIVE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Show that $4\frac{2}{3} \div 1\frac{1}{5} = 3\frac{8}{9}$

(Total for Question 1 is 3 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

www.dynamicpapers.com

2 A biased spinner can land on green or on yellow or on brown or on pink.

The table gives the probabilities that, when the spinner is spun, it will land on green or on yellow or on brown.

Colour	**green**	**yellow**	**brown**	**pink**
Probability	0.32	0.13	0.28	

Timucin spins the spinner 200 times.

Work out an estimate for the number of times the spinner lands on pink.

.....

(Total for Question 2 is 3 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

www.dynamicpapers.com

3 *ABCD* is a trapezium.

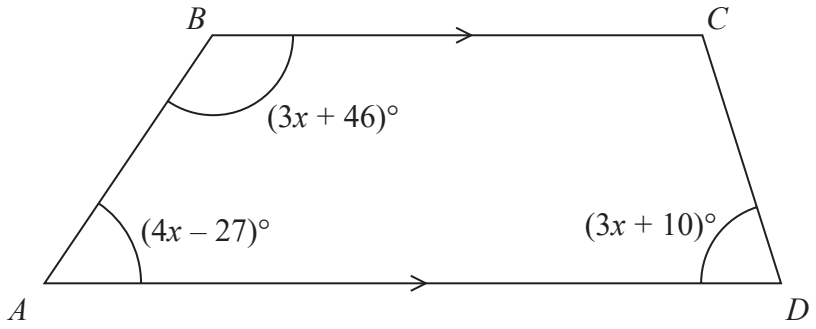


Diagram accurately

BC is parallel to *AD*

Find the size of the largest angle inside the trapezium.

.....°

(Total for Question 3 is 4 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

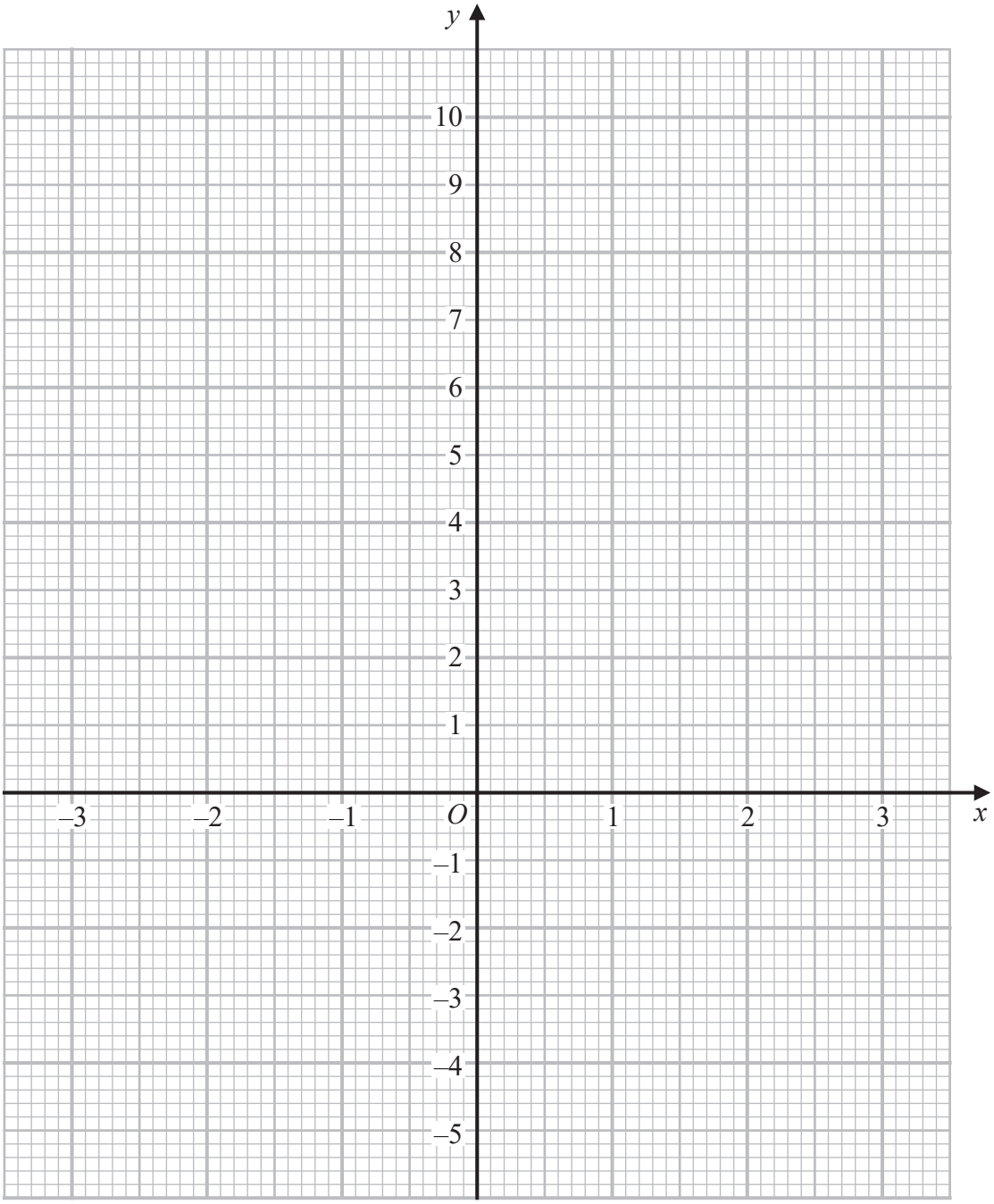
www.dynamicpapers.com

4 (a) Complete the table of values for $y = x^2 - x - 4$

x	–3	–2	–1	0	1	2	3
y		2			–4		

(2)

(b) On the grid below, draw the graph of $y = x^2 - x - 4$ for values of x from –3 to 3



(2)

(Total for Question 4 is 4 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

www.dynamicpapers.com

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

5 Nancy has some coins with a total value of 85 pence.
She has only 2 pence coins and 5 pence coins.
The ratio

number of 2 pence coins : number of 5 pence coins = 1 : 3

Nancy has more 5 pence coins than 2 pence coins.

How many more?

.....

(Total for Question 5 is 4 marks)

6 (a) Write 76 000 000 in standard form.

.....

(1)

(b) Write 5.4×10^{-4} as an ordinary number.

.....

(1)

(Total for Question 6 is 2 marks)

www.dynamicpapers.com

7

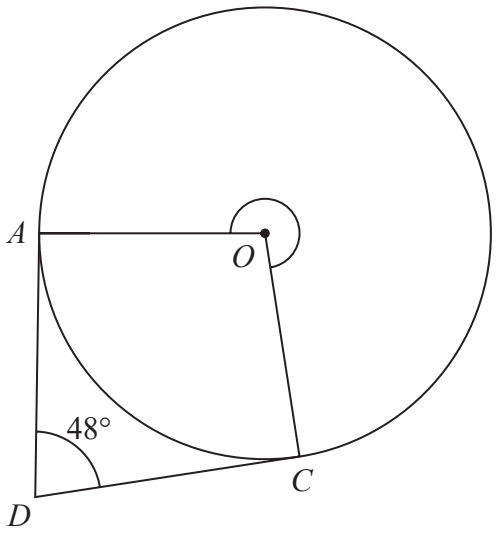


Diagram
accurately d

A and *C* are points on a circle, centre *O*
DA is the tangent to the circle at *A* and *DC* is the tangent to the circle at *C*

Angle *ADC* = 48°

Work out the size of reflex angle *AOC*

.....°

(Total for Question 7 is 3 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

www.dynamicpapers.com

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

8 Charlotte buys a painting for $680
The value of the painting increases by 4% each year.

Work out the value of the painting at the end of 3 years.
Give your answer correct to the nearest $

$.....

(Total for Question 8 is 3 marks)

9 Change a speed of 27 kilometres per hour to a speed in metres per second.

..... m/s

(Total for Question 9 is 3 marks)

www.dynamicpapers.com

10 Team **A** and Team **B** take part in a quiz league.

After 11 rounds, Team **A** has a mean score per round of 17
After 9 rounds, Team **B** has a mean score per round of 18

Both teams take part in a further round.
After this round, both teams have a mean score per round of 18.5

In the further round, Team **A** scored more points than Team **B**.

How many more?

.....

(Total for Question 10 is 4 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

www.dynamicpapers.com

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

11 Here is a 9-sided regular polygon *ABCDEFGHJ*, with centre *O*

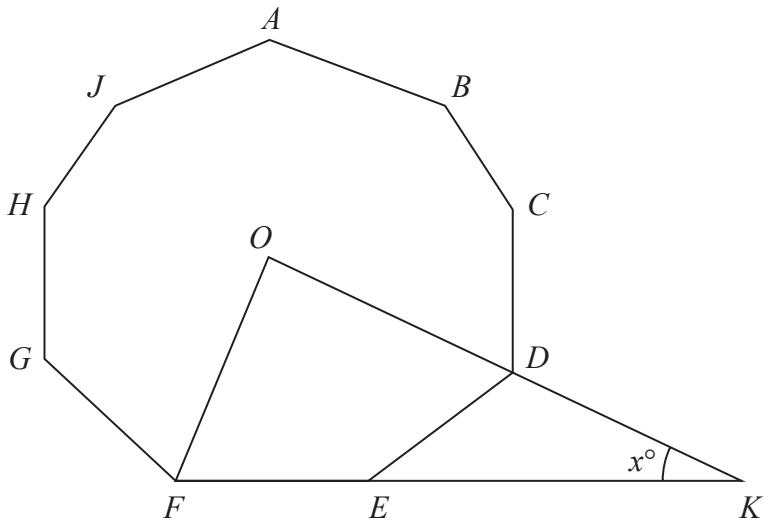


Diagram accurately d

ODK and *FEK* are straight lines.

Work out the value of *x*

x = ...

(Total for Question 11 is 3 marks)

www.dynamicpapers.com

12 The diagram shows right-angled triangle *ABD*

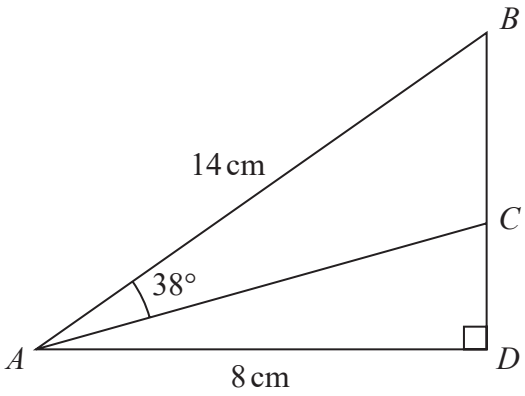


Diagram accurately

$AB = 14\,\text{cm}$ $AD = 8\,\text{cm}$

C is the point on *BD* such that angle $BAC = 38°$

Work out the length of *CD*
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 12 is 4 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

www.dynamicpapers.com

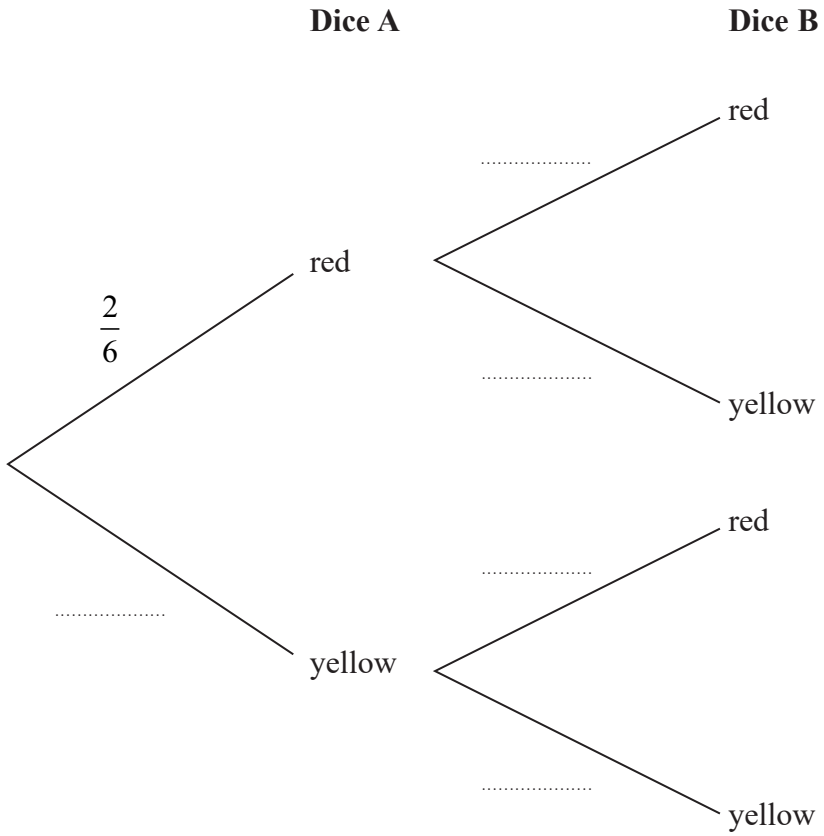
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

13 Narin has two fair 6-sided dice.

Dice **A** has 2 red faces and 4 yellow faces.
Dice **B** has 1 red face and 5 yellow faces.

Narin is going to throw each dice once.

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that both dice land on yellow.

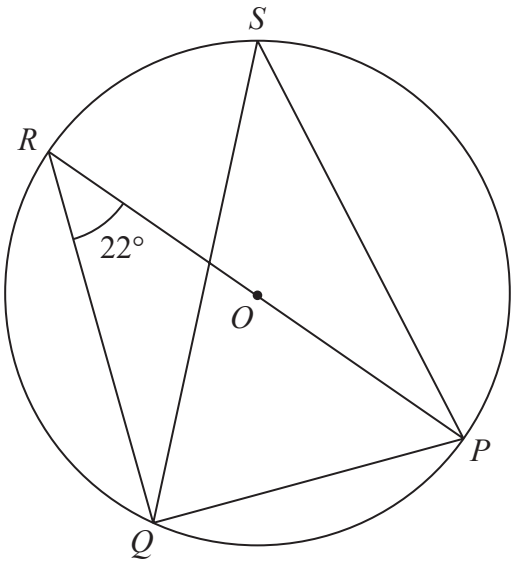
.....

(2)

(Total for Question 13 is 4 marks)

www.dynamicpapers.com

14



Diagr **OT**
accuratel wn

P, *Q*, *R* and *S* are points on a circle, centre *O*
ROP is a diameter of the circle.
Angle *PRQ* = 22°

(a) (i) Find the size of angle *RQP*

.....°

(1)

(ii) Give a reason for your answer.

.....

.....

(1)

(b) (i) Find the size of angle *PSQ*

.....°

(1)

(ii) Give a reason for your answer.

.....

.....

(1)

(Total for Question 14 is 4 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

www.dynamicpapers.com

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

15 (a) Simplify fully $\left(32a^{15}\right)^{\frac{3}{5}}$

.....

(2)

(b) Express $\left(\frac{1}{10x}\right)^{-3}$ in the form px^n where p and n are integers.

.....

(2)

(c) Solve $\frac{1-2y}{3} = \frac{4}{5} - \frac{2y-1}{2}$

Show clear algebraic working.

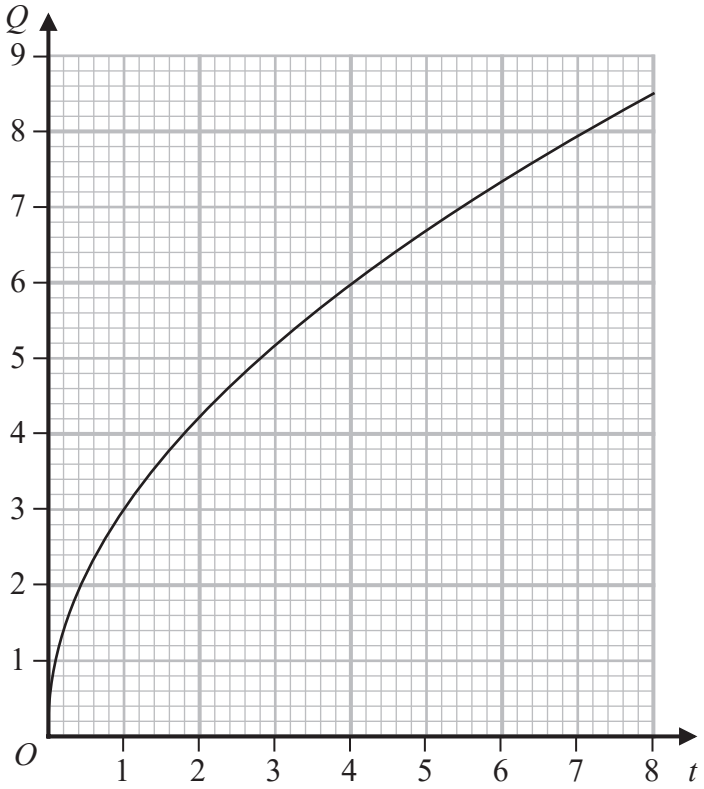
$y =$ .....

(3)

(Total for Question 15 is 7 marks)

www.dynamicpapers.com

16 Q is directly proportional to $\sqrt{t}$
The graph shows the relationship between Q and t for $0 < t < 8$



(a) Find a formula for Q in terms of t

.....

(3)

Q is increased by 20%

(b) Find the percentage increase in t

.....%

(2)

(Total for Question 16 is 5 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

www.dynamicpapers.com

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

17 (a) Expand and simplify $(x + 6)(3x - 2)(x + 6)$

.....

(3)

(b) Make e the subject of $w = \sqrt{\dfrac{e + g}{ef - d}}$

.....

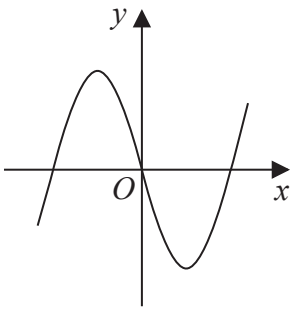
(4)

(Total for Question 17 is 7 marks)

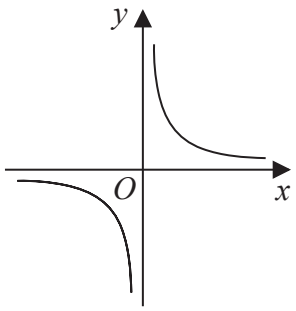
www.dynamicpapers.com

18 Here are 6 graphs.

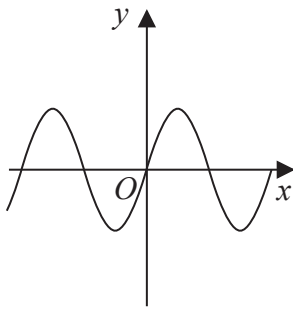
Graph A



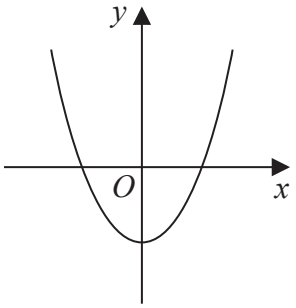
Graph B



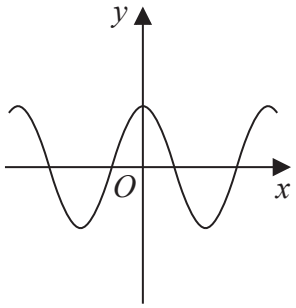
Graph C



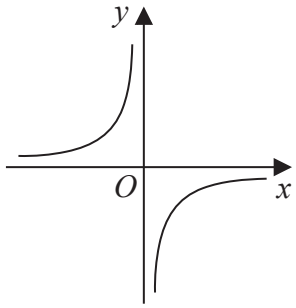
Graph D



Graph E



Graph F



Complete the table below with the letter of the graph that could represent each given equation.

Write your answers on the dotted lines.

Equation	Graph
$y = \sin x$	.....
$y = -\frac{3}{x}$	.....
$y = 4x^3 - 5x$	.....

(Total for Question 18 is 3 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

www.dynamicpapers.com

19 Express $3x^2 - 6x + 5$ in the form $a(x - b)^2 + c$

.....

(Total for Question 19 is 3 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

www.dynamicpapers.com

20 There are 12 counters in a bag.

3 of the counters are red
9 of the counters are green

Ameya, Jack and Ella each take at random one counter from the bag.

Work out the probability that at least one red counter is still in the bag.

.....

(Total for Question 20 is 3 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

www.dynamicpapers.com

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

21 Solve the simultaneous equations

$$2x^2 + 3y^2 = 11$$
$$x = 3y - 1$$

Show clear algebraic working.

(Total for Question 21 is 5 marks)

www.dynamicpapers.com

22 The diagram shows a triangle ABC and a flagpole BF

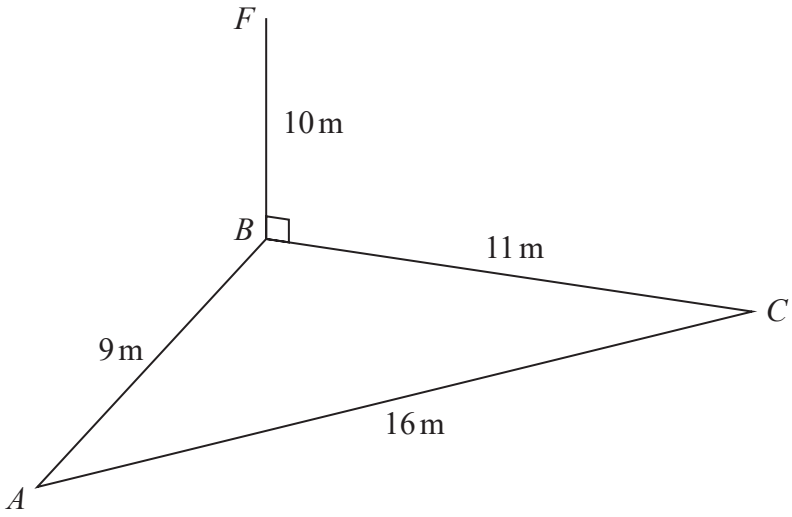


Diagram accurately d

A, B and C are points on horizontal ground.

BF is vertical.

$AB = 9\,\text{m}$ $BC = 11\,\text{m}$ $AC = 16\,\text{m}$ $BF = 10\,\text{m}$

D is the point on AC such that angle $BDC = 90°$

Work out the size of the angle of elevation of the point F from the point D
Give your answer correct to one decimal place.

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

www.dynamicpapers.com

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

.....°

(Total for Question 22 is 5 marks)

Turn over for Question 23

www.dynamicpapers.com

23 The diagram shows a cuboid with a square cross section.

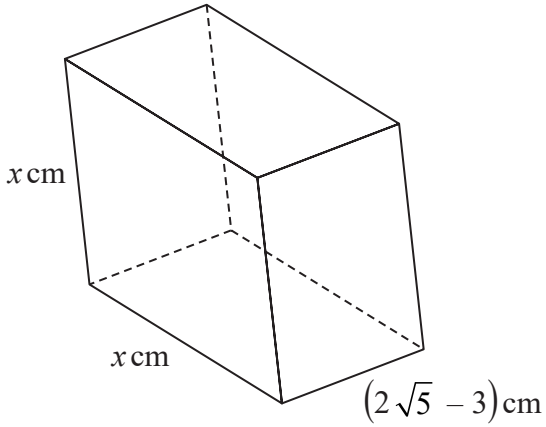


Diagram
accurately d

The volume of the cuboid is $(13 + 6\sqrt{5})\text{cm}^3$

Without using a calculator, find the value of x
Give your answer in the form $a + \sqrt{b}$ where a and b are integers.
Show your working clearly.

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

www.dynamicpapers.com

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

$x =$ .....

(Total for Question 23 is 4 marks)

Turn over for Question 24

www.dynamicpapers.com

24 $ABCD$ is a kite with $AB = AD$ and $CB = CD$

A is the point with coordinates $(-2, 10)$

B is the point with coordinates $\left(-\frac{27}{5}, 4\right)$

C is the point with coordinates $(4, -5)$

Work out the coordinates of D

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

www.dynamicpapers.com

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

(..... , ...)

(Total for Question 24 is 6 marks)

Turn over for Question 25

www.dynamicpapers.com

25 A solid sphere has a radius of 2.8 centimetres, correct to 1 decimal place.
The sphere has a mass of $M\pi$ grams, where $M = 260$ correct to 2 significant figures.

Work out the upper bound for the density of the sphere.
Give your answer in g / cm^3 correct to 2 decimal places.
Show your working clearly.

..... g / cm^3

(Total for Question 25 is 4 marks)

TOTAL FOR PAPER IS 100 MARKS

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA