Write your name here

Surname	Other names

Edexcel GCSE

Centre Number	Candidate Number

Mathematics A

Paper 1 (Non-Calculator)

Practice Papers Set D

Higher Tier

Time: 1 hour 45 minutes

Paper Reference
1MA0/1H

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. 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.
- Calculators must not be used.

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.
- Questions labelled with an asterisk (*) are ones where the quality of your written communication will be assessed.

Advice

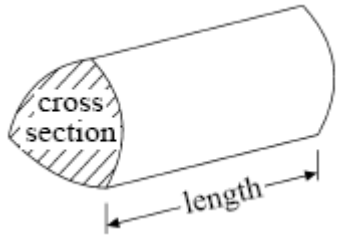
- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

GCSE Mathematics (Linear) 1MA0

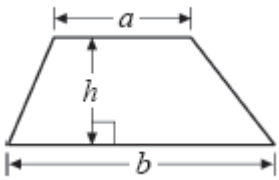
Formulae: Higher Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

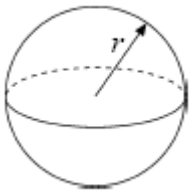
Volume of prism = area of cross section × length



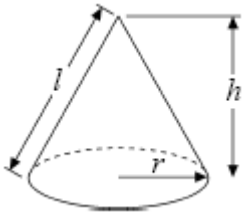
Area of trapezium = $\frac{1}{2}(a + b)h$



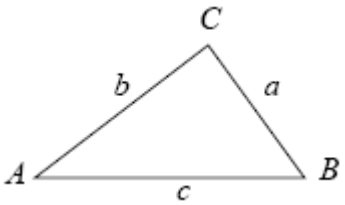
Volume of sphere $\frac{4}{3}\pi r^3$
Surface area of sphere = $4\pi r^2$



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



In any triangle ABC



The Quadratic Equation
The solutions of $ax2+ bx + c = 0$
where $a \neq 0$, are given by

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

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 = $\frac{1}{2}ab \sin C$

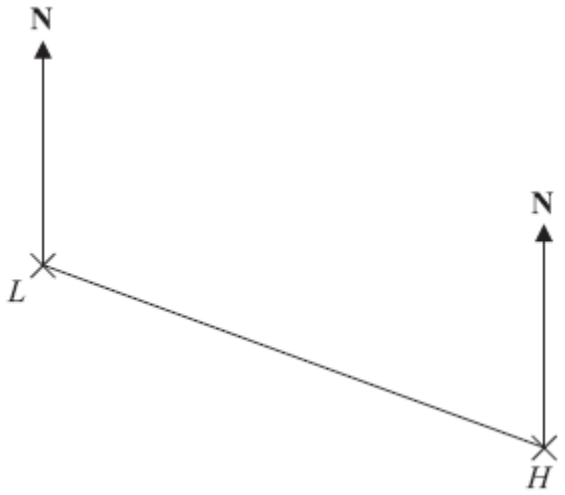
Answer ALL TEWNTY NINE questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1. The diagram shows the position of a lighthouse *L* and a harbour *H*.



The scale of the diagram is 1 cm represents 5 km.

(a) Measure the bearing of *H* from *L*.

.....°

(1)

A boat *B* is 20 km from *H* on a bearing of 040°.

(b) On the diagram, mark the position of boat *B* with a cross (×).
Label it *B*.

(2)

(Total for Question 1 is 3 marks)

---

2. Simplify $(m^{-2})^5$

.....

(Total for Question 2 is 1 mark)

---

3. Solve the simultaneous equations

$$5x + 2y = 11$$
$$4x - 3y = 18$$

x = ...

y = ...

(Total for Question 3 is 4 marks)

---

4. Here is a map.
The map shows two towns, Burford and Hightown.

Scale: 1 cm represents 10 km

A company is going to build a warehouse.

The warehouse will be less than 30 km from Burford **and** less than 50 km from Hightown.

Shade the region on the map where the company can build the warehouse.

(Total for Question 4 is 3 marks)

---

5. The table shows information about the speeds of 100 lorries.

Speed (s) in km/h	**Frequency**
$0 < s \leq 20$	2
$20 < s \leq 40$	9
$40 < s \leq 60$	23
$60 < s \leq 80$	31
$80 < s \leq 100$	27
$100 < s \leq 120$	8

Find an estimate for the number of lorries with a speed of more than 90 km/h.

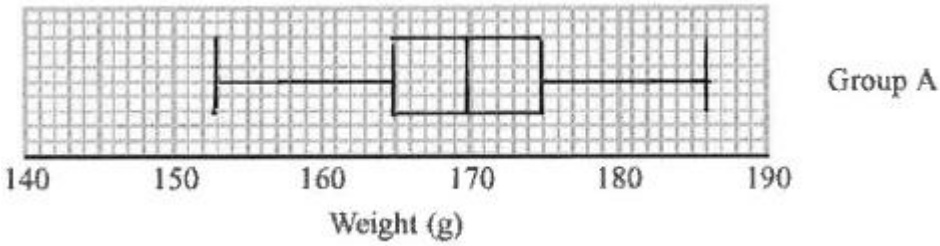
.....

(Total for Question 5 is 2 marks)

6. Harry grows tomatoes.
This year he put his tomato plants into two groups, group A and group B.

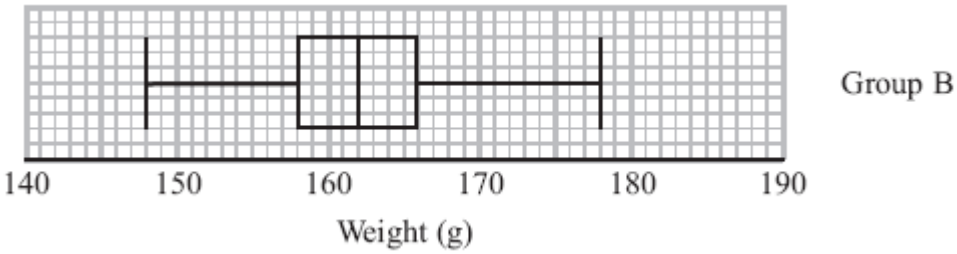
Harry gave fertiliser to the tomato plants in group A.
He did not give fertiliser to the tomato plants in group B.

Harry weighed 60 tomatoes from group A.



Harry did not give fertiliser to the tomato plants in group B.

Harry weighed 60 tomatoes from group B.
He drew this box plot for his results.



Compare the distribution of the weights of the tomatoes from group A with the distribution of the weights of the tomatoes from group B.

.....

.....

.....

.....

(Total for Question 6 is 2 marks)

7. Jane has a carton of orange juice.
The carton is in the shape of a cuboid.

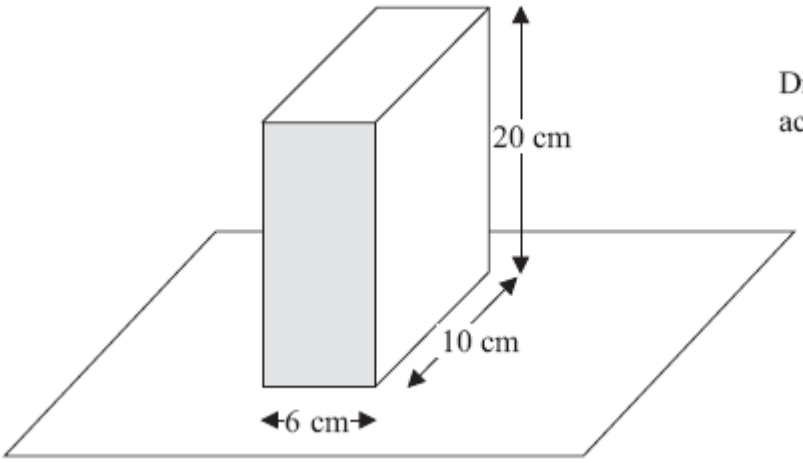


Diagram **NOT** accurately drawn

The depth of the orange juice in the carton is 8 cm.

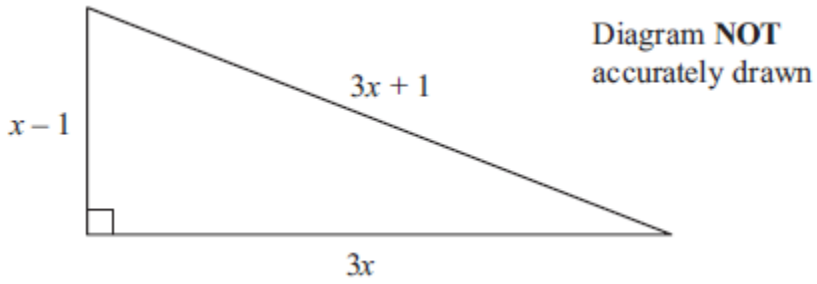
Jane closes the carton.
Then she turns the carton over so that it stands on the shaded face.

Work out the depth, in cm, of the orange juice now.

..... cm

(Total for Question 7 is 3 marks)

8. The diagram shows a triangle.



In the diagram, all the measurements are in metres.

The perimeter of the triangle is 56 m.
The area of the triangle is A m^2.

Work out the value of A.

.....

(Total for Question 8 is 4 marks)

9. Sam wants to find out the types of film people like best.

He is going to ask whether they like comedy films or action films or science fiction films or musicals best.

Design a suitable table for a data collection sheet he could use to collect this information.

(Total for Question 9 is 2 marks)

---

10. Solve the simultaneous equations

$$3x + 2y = 4$$
$$4x + 5y = 17$$

x = ...

y = ...

(Total for Question 10 is 4 marks)

11.

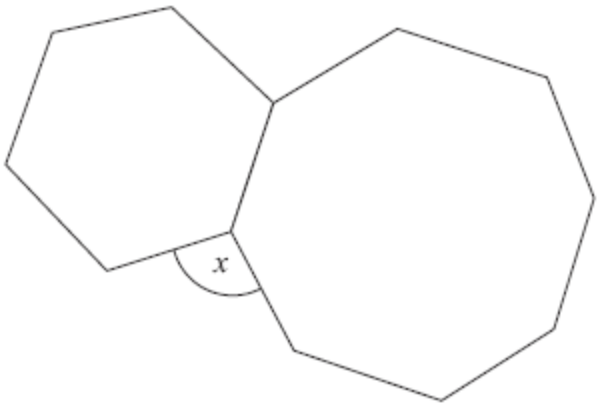


Diagram **NOT** accurately drawn

The diagram shows a regular hexagon and a regular octagon.

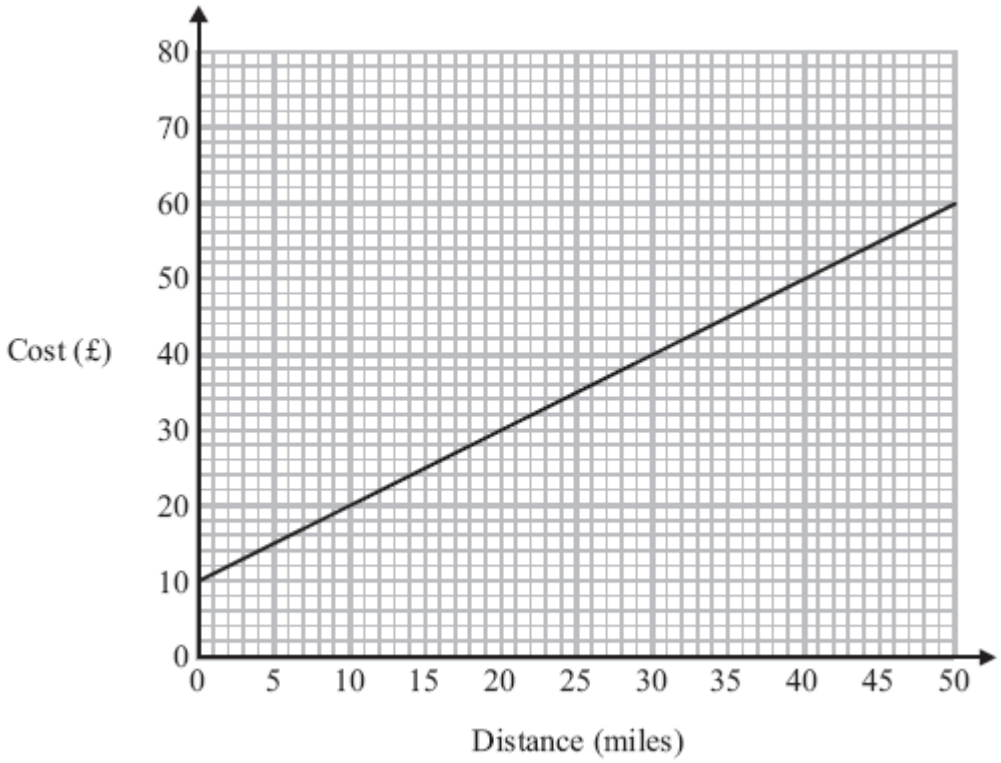
Calculate the size of the angle marked x.
You must show all your working.

.....°

(Total for Question 11 is 4 marks)

***12.** Bill uses his van to deliver parcels.
For each parcel Bill delivers there is a fixed charge plus £1.00 for each mile.

You can use the graph to find the total cost of having a parcel delivered by Bill.

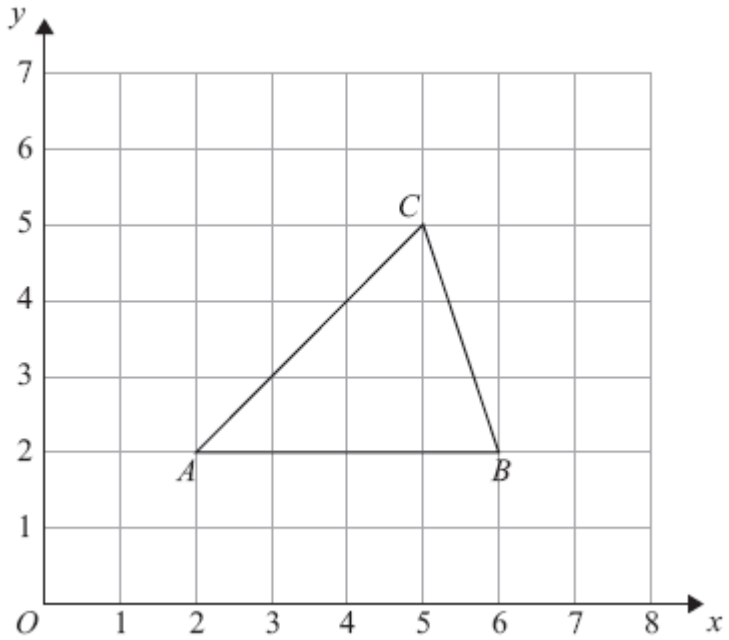


Ed uses a van to deliver parcels.
For each parcel Ed delivers it costs £1.50 for each mile.
There is **no** fixed charge.

Compare the cost of having a parcel delivered by Bill with the cost of having a parcel delivered by Ed.

(Total for Question 12 is 3 marks)

13.



Triangle *ABC* is drawn on a centimetre grid.
A is the point (2, 2).
B is the point (6, 2).
C is the point (5, 5).

Triangle *PQR* is an enlargement of triangle *ABC* with scale factor $\frac{1}{2}$ and centre (0, 0).

Work out the area of triangle *PQR*.

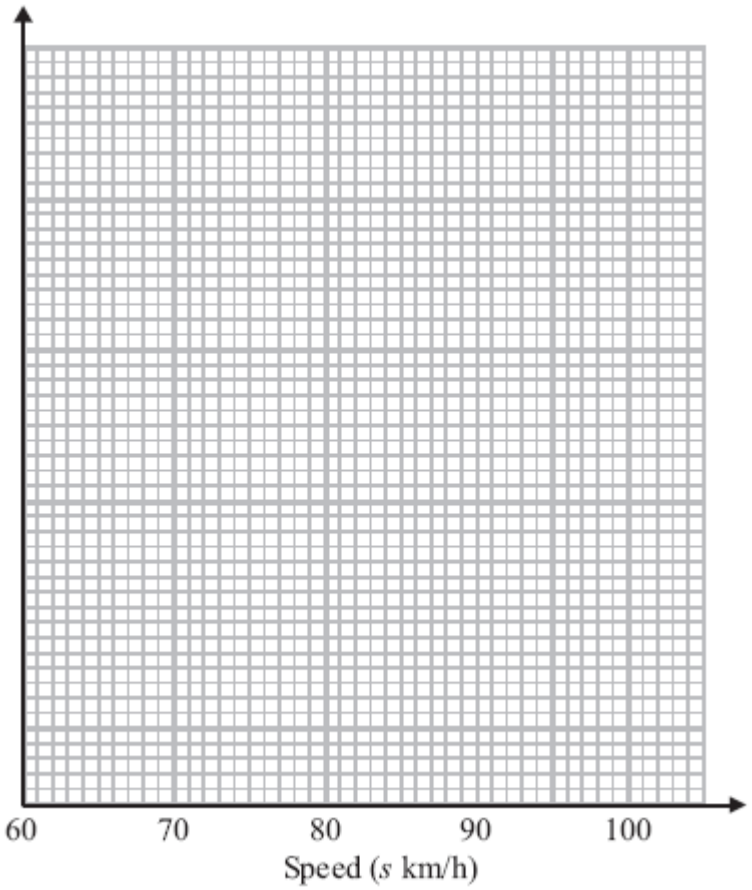
..... cm^2

(Total for Question 13 is 3 marks)

14. The table gives some information about the speeds, in km/h, of 100 cars.

Speed(s km/h)	Frequency
$60 < s \leq 65$	15
$65 < s \leq 70$	25
$70 < s \leq 80$	36
$80 < s \leq 100$	24

(a) On the grid, draw a histogram for the information in the table.



(3)

(b) Work out an estimate for the number of cars with a speed of more than 85 km/h.

.....

(2)

(Total for Question 14 is 5 marks)

15 . The diagram shows a circle drawn inside a square.

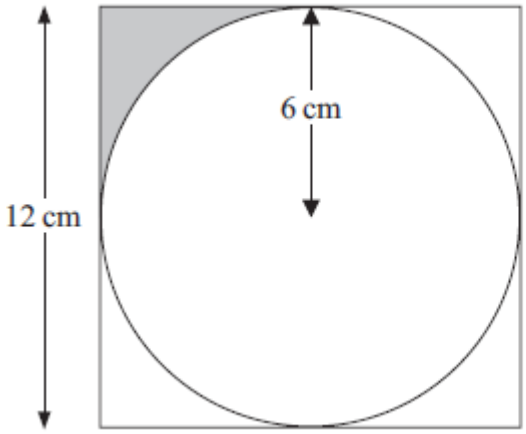


Diagram **NOT** accurately drawn

The circle has a radius of 6 cm.
The square has a side of length 12 cm.

Work out the shaded area.
Give your answer in terms of π.

.....cm^2

(Total for Question 15 is 3 marks)

16. The diagram shows part of a pattern made from tiles.

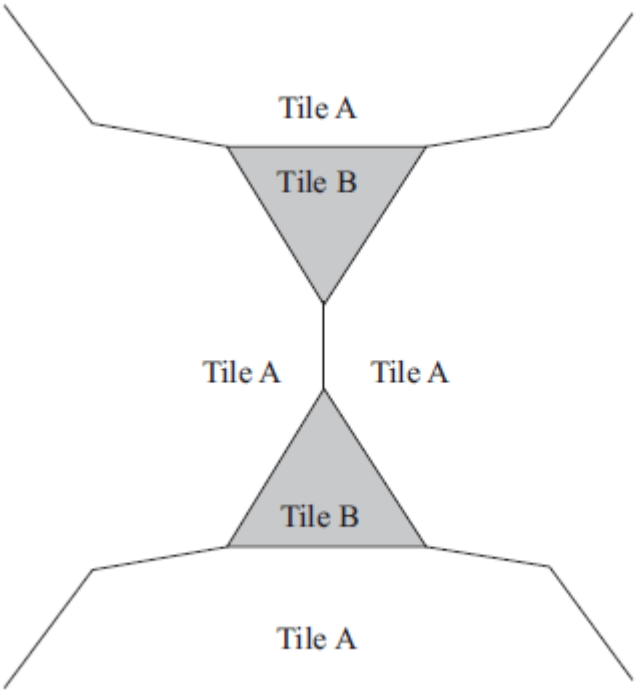


Diagram **NOT** accurately drawn

The pattern is made from two types of tiles, tile A and tile B.

Both tile A and tile B are regular polygons.

Work out the number of sides tile A has.

.....

(Total for Question 16 is 4 marks)

***17.**

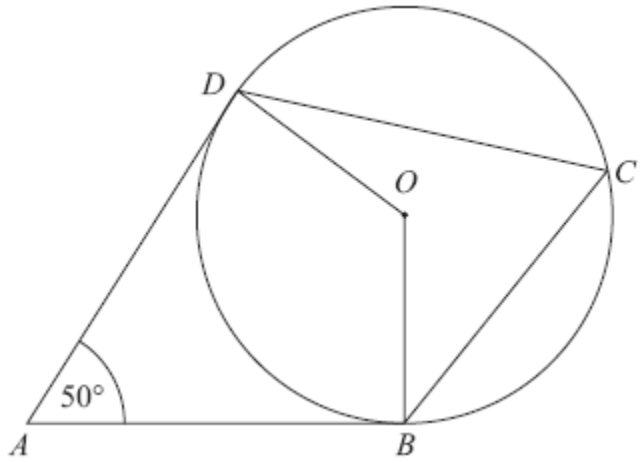


Diagram **NOT** accurately drawn

B, *C* and *D* are points on the circumference of a circle, centre *O*.
AB and *AD* are tangents to the circle.

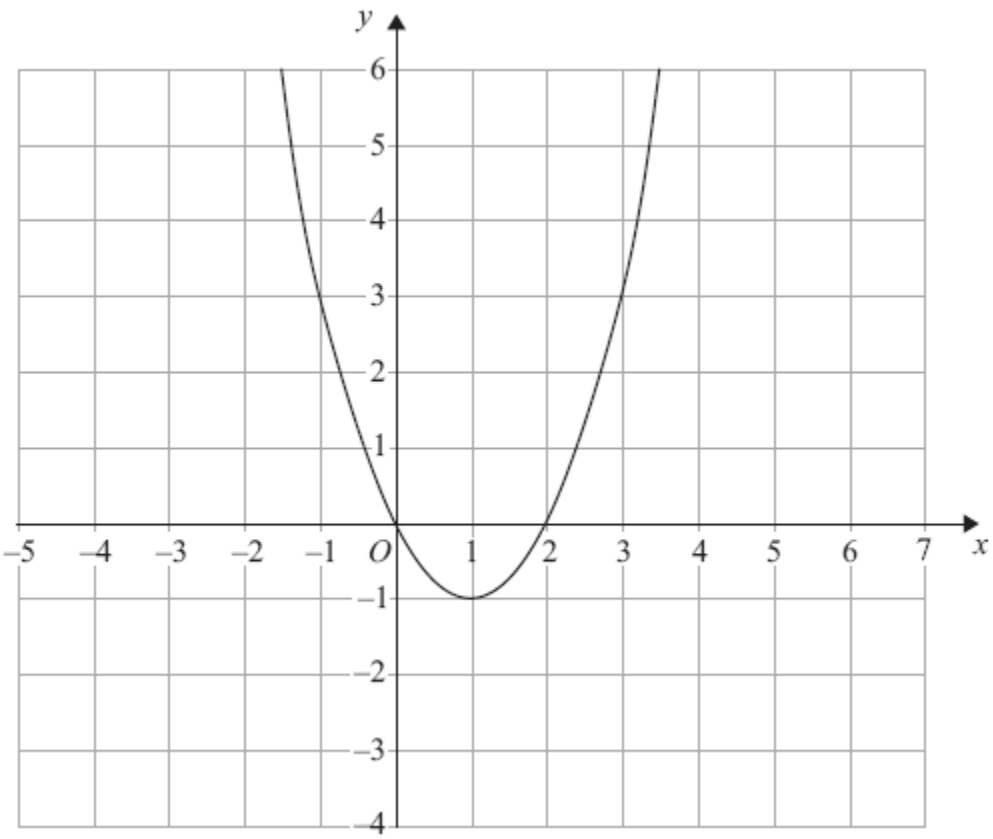
Angle *DAB* = 50°

Work out the size of angle *BCD*.
Give a reason for each stage in your working.

(Total for Question 17 is 4 marks)

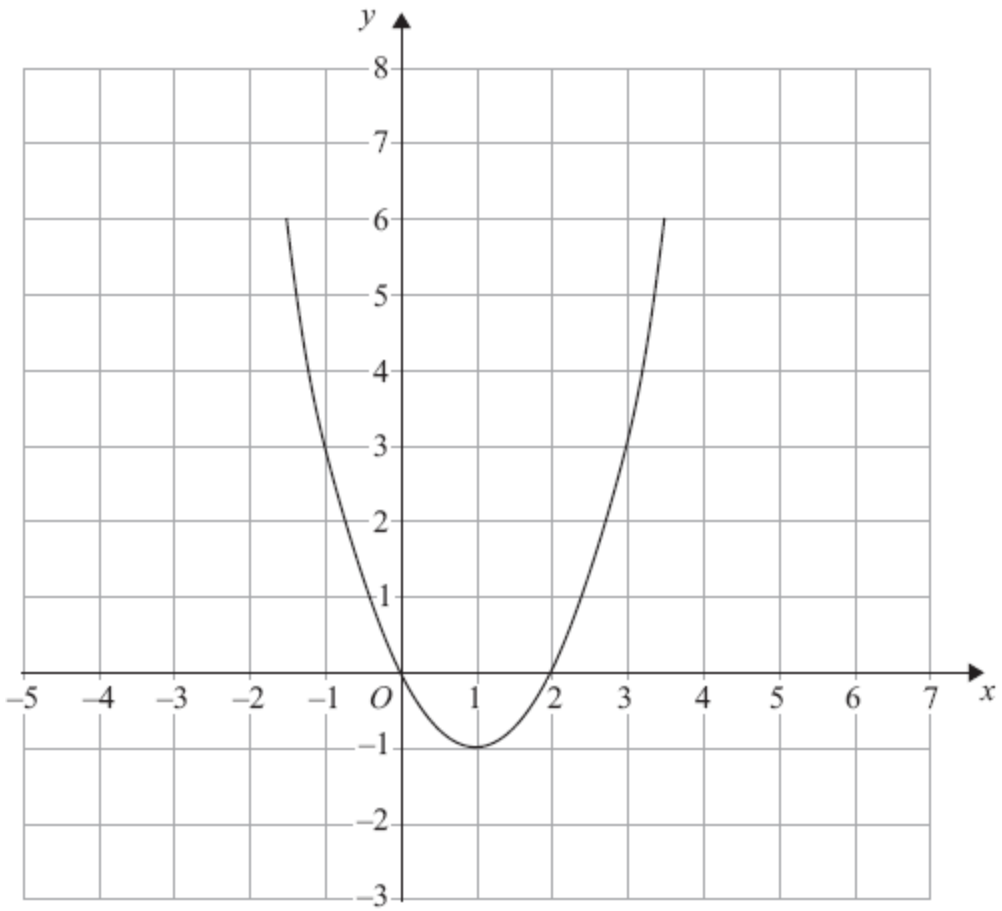
18. The graph of $y = f(x)$ is shown on each of the grids.

(a) On this grid, sketch the graph of $y = f(x - 3)$



(2)

(b) On this grid, sketch the graph of $y = 2f(x)$



(2)

(Total for Question 18 is 4 marks)

---

19. (a) Simplify fully $\dfrac{x^2+3x-4}{2x^2-5x+3}$

.....

(3)

(b) Write $\dfrac{4}{x+2} + \dfrac{3}{x-2}$ as a single fraction in its simplest form.

.....

(3)

(Total for Question 19 is 6 marks)

---

20. (a) Rationalise the denominator of $\frac{5}{\sqrt{2}}$

.....

(2)

(b) Expand and simplify $(2 + \sqrt{3})^2 - (2 - \sqrt{3})^2$

.....

(2)

(Total for Question 20 is 4 marks)

---

21. The bearing of a ship from a lighthouse is 050°

Work out the bearing of the lighthouse from the ship.

.....°

(Total for Question 21 is 2 marks)

22. Express the recurring decimal $0.28\dot{1}$ as a fraction in its simplest form.

.....

(Total for Question 22 is 3 marks)

---

23. The diagram shows a solid metal cylinder.

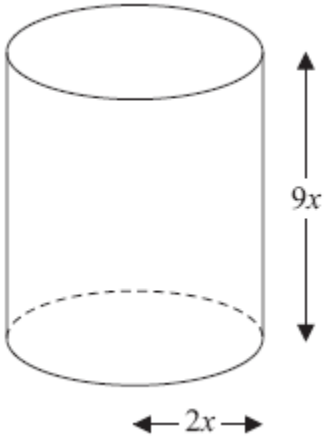


Diagram **NOT** accurately drawn

The cylinder has base radius $2x$ and height $9x$.

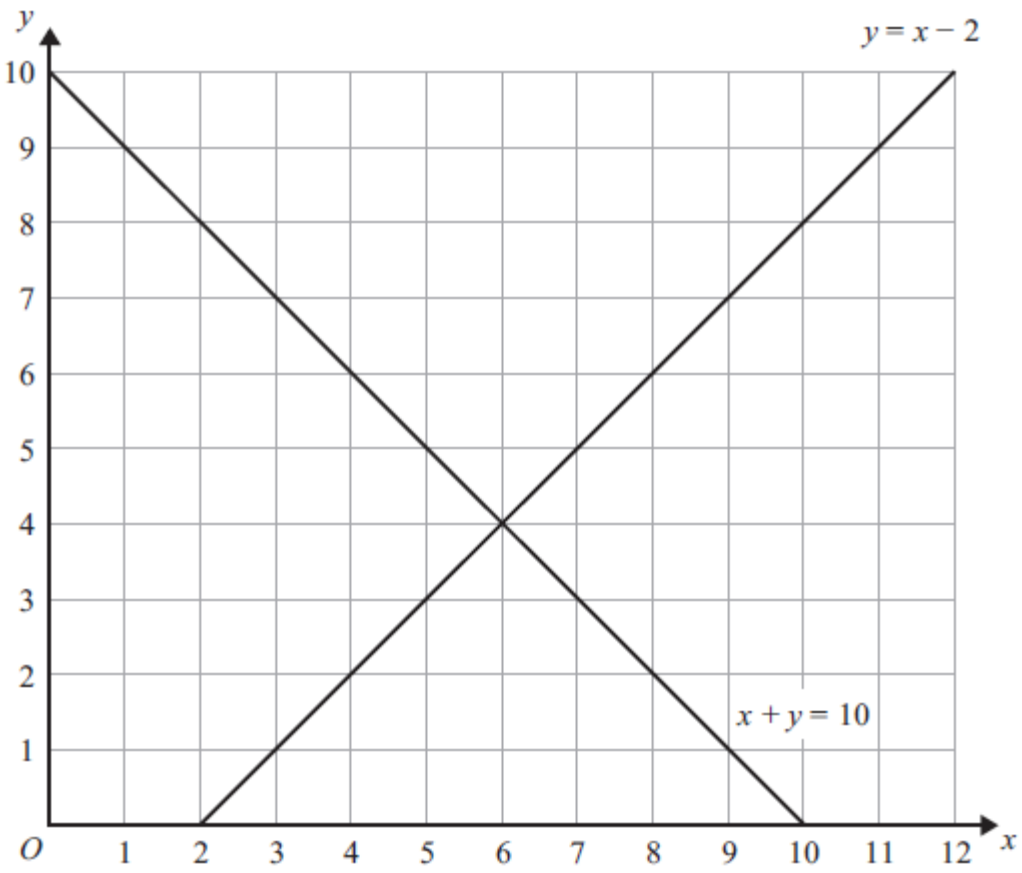
The cylinder is melted down and made into a sphere of radius r.

Find an expression for r in terms of x.

.....

(Total for Question 23 is 3 marks)

24. The lines $y = x - 2$ and $x + y = 10$ are drawn on the grid.



On the grid, mark with a cross (×) each of the points with integer coordinates that are in the region defined by

$$y > x - 2$$

$$x + y < 10$$

$$x > 3$$

(Total for Question 24 is 3 marks)

---

25. Make t the subject of the formula

$$p = \frac{3 - 2t}{4 + t}$$

.....

(Total for Question 25 is 4 marks)

26. The diagram shows two similar solids, A and B.

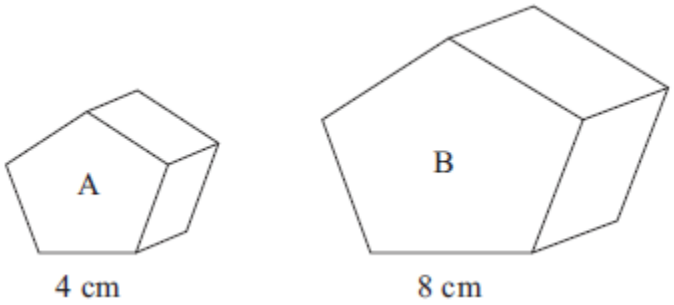


Diagram **NOT** accurately drawn

Solid A has a volume of 80 cm^3.

(a) Work out the volume of solid B.

.....cm^3

(2)

Solid B has a total surface area of 160 cm^2.

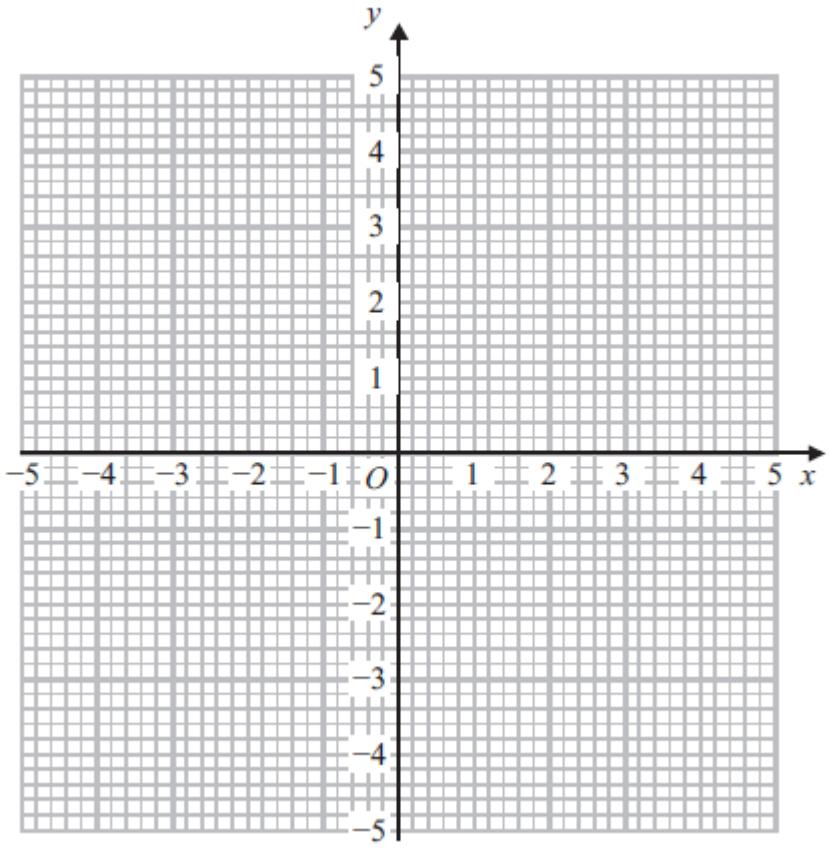
(b) Work out the total surface area of solid A.

.....cm^2

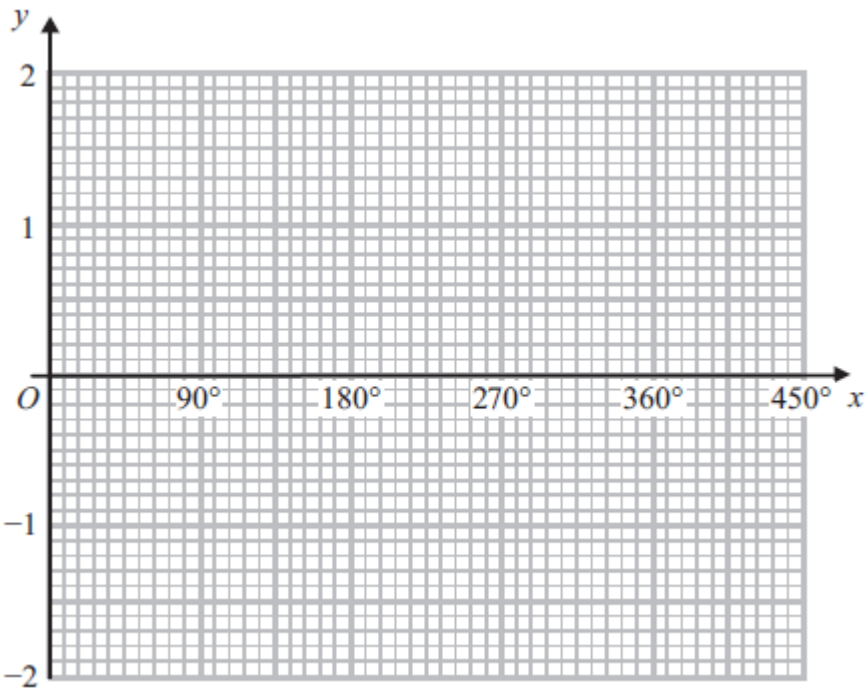
(2)

(Total for Question 26 is 4 marks)

27.



(a) On the grid, draw the graph of $x^2 + y^2 = 4$



(2)

(b) On the grid, sketch the graph of $y = \cos x$ for $0° \leq x \leq 360°$

(2)

(Total for Question 27 is 4 marks)

28.

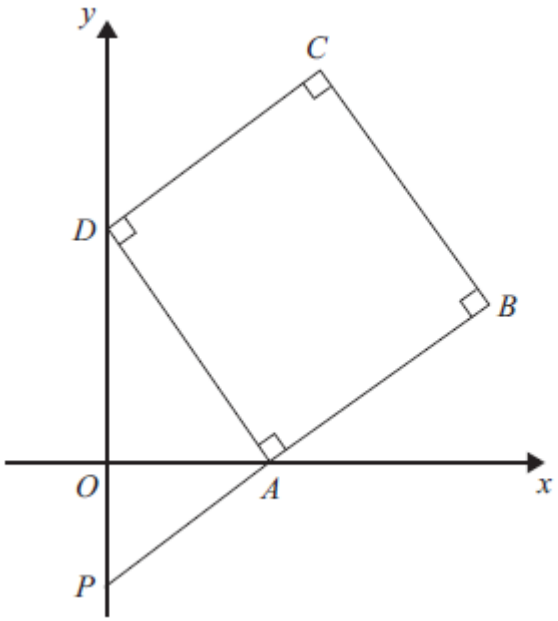


Diagram **NOT** accurately drawn

ABCD is a square.
P and *D* are points on the *y*-axis.
A is a point on the *x*-axis.
PAB is a straight line.

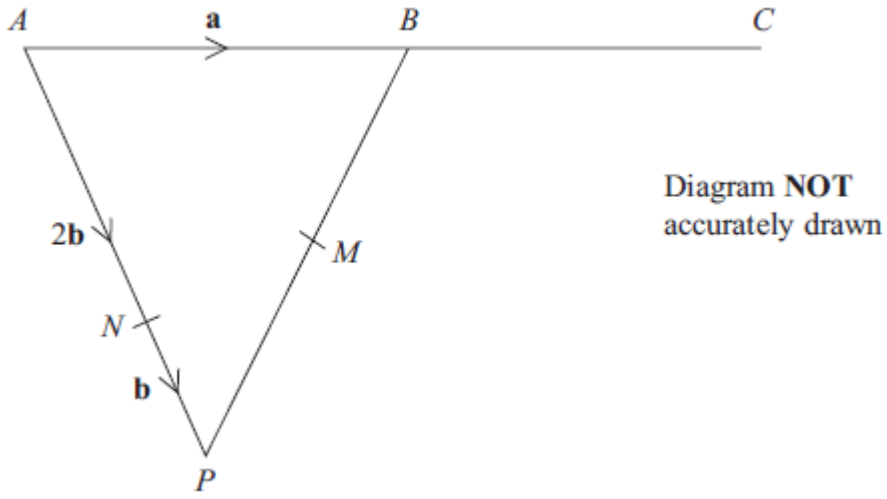
The equation of the line that passes through the points *A* and *D* is $y = -2x + 6$

Find the length of *PD*.

.....

(Total for Question 28 is 4 marks)

29.



APB is a triangle.
N is a point on *AP*.

$\overrightarrow{AB} = \mathbf{a}$ $\overrightarrow{AN} = 2\mathbf{b}$ $\overrightarrow{NP} = \mathbf{b}$

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

.....

(1)

B is the midpoint of *AC*.
M is the midpoint of *PB*.

*(b) Show that *NMC* is a straight line.

(4)

(Total for Question 29 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS