

Name: \_\_\_\_\_

GCSE Maths 2022  
AQA Foundation Paper 1  
Set B  
Non-Calculator



### Equipment

1. A black ink ball-point pen.
2. A pencil.
3. An eraser.
4. A ruler.
5. A pair of compasses.
6. A protractor.

### Guidance

1. Read each question carefully.
2. Check your answers seem right.
3. Always show your workings

### Information

1. This paper has been created based on topics in the Advance Information.
2. Also see Corbettmaths for the checklist for the entire GCSE as these topics may still be useful for Paper 1
3. There is one question per topic - this paper is designed to give an opportunity to practice each topic rather than replicate the actual paper.
4. The marks for questions are shown in brackets

[GCSE 2022 Resources](#)



1. A cinema has 16 seats in each row.  
There are 24 rows.  
During a movie, there are 45 empty seats.  
Work out how many people watched the movie.

.....  
**(3)**

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2. Bradley buys 12 rulers.  
He pays with a £20 note.  
His change is £14.60  
What is the cost of one ruler?

.....  
**(3)**

3. In year 8 there are 197 students.  
In year 9 there are 212 students.  
In year 10 there are 235 students.  
How many students are there in total in years 8, 9 and 10?

.....  
**(2)**

- 
4. Grace is saving money for a new guitar.  
The guitar costs £49.50  
In January she saved £7.85  
In February she saved £14.26  
Work out how much more money Grace needs to save

.....  
**(3)**

5. Helen jogs at an average speed of 9.8 kilometres per hour.

Helen runs 3 kilometres.

(a) Work out an estimate for how long it takes Helen to run 3 kilometres.

.....  
**(3)**

(b) Is your answer to (a) an underestimate or an overestimate?  
Give a reason for your answer.

.....  
.....  
**(1)**

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6. Work out

(a)  $10 + 3 \times 2$

.....  
**(1)**

(b)  $8 \div 2 + 12 \div 4$

.....  
**(1)**

7. The population of the United Kingdom in 1951 was  $5.08 \times 10^7$   
The population of the United Kingdom in 2015 was  $6.47 \times 10^7$

Work out how many more people live in the United Kingdom in 2015 than 1951.  
Give your answer as an ordinary number.

.....  
(3)

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8. Alisha buys 200 books costing £3 each.

She sells  $\frac{2}{5}$  of the books at £8 each.

Alisha then reduces the price of the remaining books by a quarter.

She then sells some of the remaining books.

Alisha makes £490 profit.

Work out how many books Alisha did **not** sell.

.....  
(5)

9. Work out  $3\frac{1}{2} - 2\frac{5}{9}$

.....  
**(2)**

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10. Alexis has a pet dog, Maxi.

Each day, Maxi eats  $\frac{2}{3}$  of a can of dog food.

Alexis is buying dog food for one week.

How many cans of dog food should Alexis buy?

.....  
**(3)**

11. Work out  $1\frac{2}{3} \div 2\frac{1}{4}$

.....  
(2)

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12. What is the reciprocal of 0.25?

Circle the correct answer.

4                  1.25                   $\frac{1}{4}$                   -0.25

(1)

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13. Susan brings 500 flapjacks to a local fair.  
Susan sells 450 of the flapjacks.

What percentage of the flapjacks did Susan sell?

.....%  
(2)

14. Which is larger?

35% of 180 or  $\frac{1}{20}$  of 1200

.....  
**(3)**

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15. In a survey, the ratio of the number of people who preferred tea to those who preferred coffee was 9:5

Altogether 84 people were surveyed.

How many more people preferred tea than coffee?

.....  
**(3)**

16. These are the temperatures in towns cities on the same day.

Towns	Temperature (°C)
Leek	-8
Milton	12
Donhampton	-11
Redtown	7
Sandville	-16

(a) Which town has the highest temperature?

.....  
**(1)**

(b) Which town has the lowest temperature?

.....  
**(1)**

(c) The temperature in Randalstown at the same time is 10°C colder than Leek

What is the temperature in Randalstown?

.....°C  
**(1)**

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17. Barry is saving money towards a new motorbike that costs £4,000.  
He saves £60 each month.

Work out what fraction of the total cost he saved over the first year of saving.  
Give your answer in its simplest form.

.....  
**(3)**

18. A shop sells doughnuts in two different size bags.

Small bag  
Contents  
3 doughnuts

£1.08

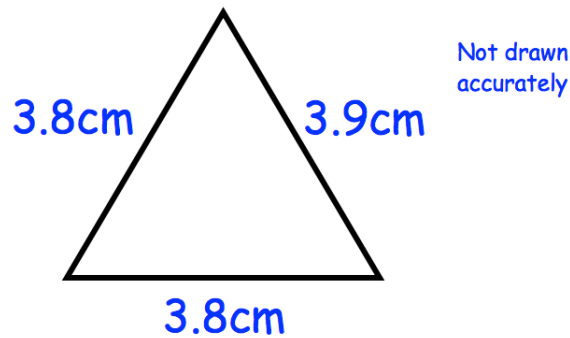
Large bag  
Contents  
5 doughnuts

£1.70

Which is the better value for money?  
You must show all your working.

(3)

19. Shown below is a triangle.



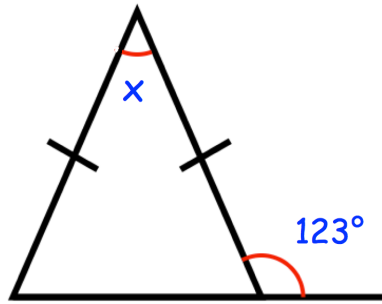
(a) Write down the type of triangle shown.

.....  
(1)

(b) Work out the perimeter of the triangle.

.....  
(1)

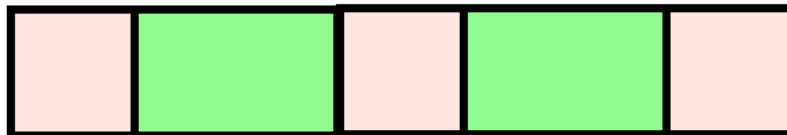
20.



Find the size of angle  $x$ .

.....°  
(2)

21. A design is made from some identical rectangles and identical squares.



Each rectangle is twice as long as each square.  
The perimeter of each square is 22cm.

Calculate the perimeter of the design.

.....cm  
(4)

22. (a) Change 16m to cm.

.....cm  
(1)

(b) Change 400m to km.

.....km  
(1)

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23. Use ruler and compasses to construct the perpendicular bisector of AB.  
You **must** show clearly all your construction arcs.

A .

. B

(2)

24. A and B are two points.

A  
x

B  
x

Shade the region which contains those points which are both closer to A than to B, and less than 5cm from B.

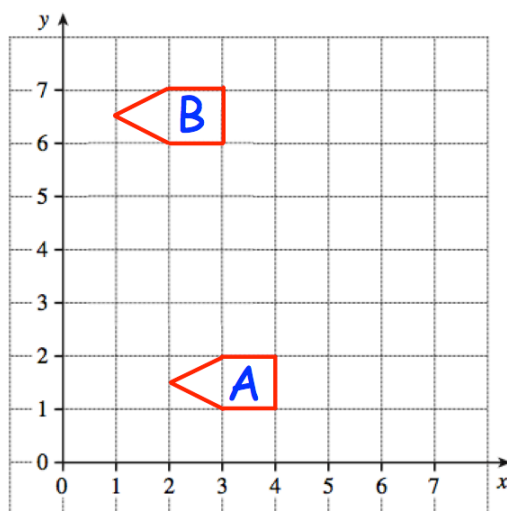
(2)

25. A solid glass cube has side length of 10cm.  
The mass of the glass cube is 2.5kg.

Find the density of glass.  
Give your answer in  $\text{g/cm}^3$

..... $\text{g/cm}^3$   
**(3)**

- 26.

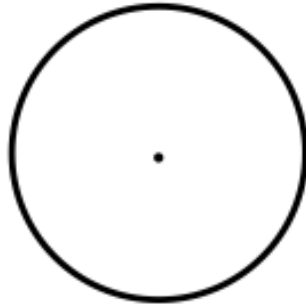


Write down the translation vector that would take A to B.

$\begin{pmatrix} \dots\dots\dots \\ \dots\dots\dots \end{pmatrix}$

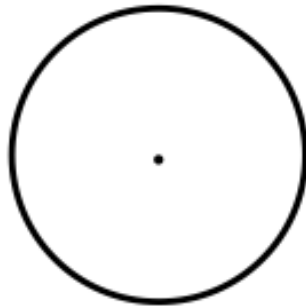
**(1)**

27. (a) Draw an arc on the circle.



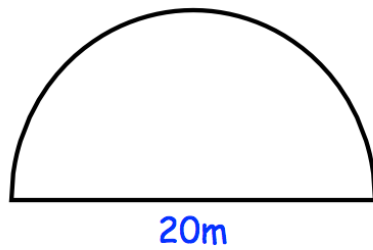
(1)

(b) Draw and shade in a segment of the circle.



(1)

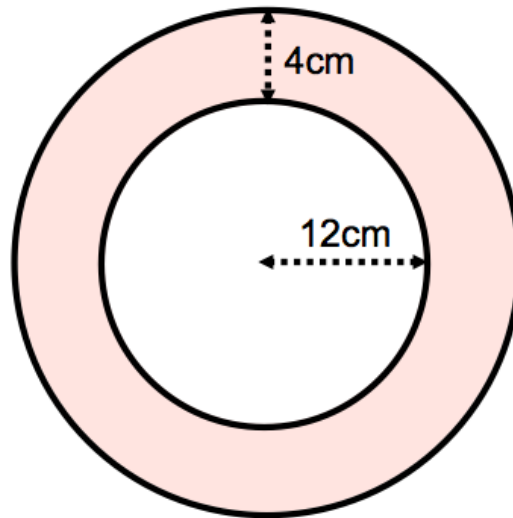
28. A semi-circle has diameter 20cm.



Calculate the perimeter of the semi-circle.  
Give your answer in terms of  $\pi$

.....m  
(2)

29. Shown below is a circular photo surrounded by a frame.

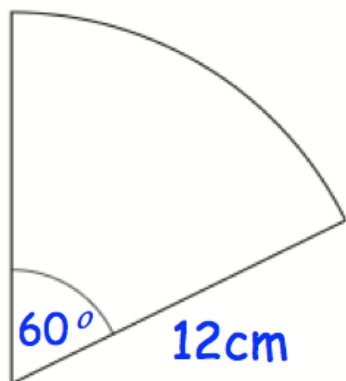


The photo has radius 12cm.  
The frame has width 4cm.

Work out area of the frame.  
This area is shaded in the diagram.  
Give your answer in terms of  $\pi$

.....cm<sup>2</sup>  
(3)

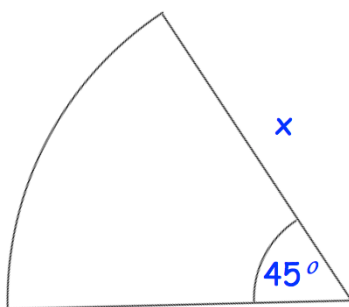
30. Shown is a sector of a circle.



Calculate the length of the arc, giving your answer in terms of  $\pi$ .

.....cm  
(3)

31. Shown below is a sector of a circle, with radius  $x$  cm.



The area of the sector is  $18\pi\text{ cm}^2$

Find the length of  $x$ .

.....cm  
(3)

32. 100 students study one language at a college.  
The students are either in Year 12 or Year 13.

Some students study French.  
Some students study Spanish.  
The rest of the students study German.

54 of the people are in Year 12.  
20 of the 29 people who study Spanish are in Year 13.  
31 people study German.  
15 Year 13 students study French.

Work out the number of Year 12 students who study German.

33. There are 20 counters in a bag.

2 of the counters are white.

1 of the counters is pink.

4 of the counters are black.

The rest of the counters are purple.

Carter takes a counter at random from the bag.

Show that the probability that the counter is white or purple is  $\frac{3}{4}$

.....  
**(2)**

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34. Magnus flips a fair coin once and rolls an ordinary dice once.

(a) Write down all the possible outcomes.

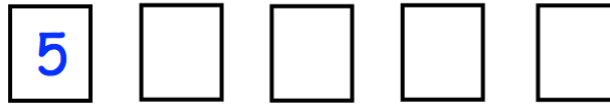
.....  
.....  
.....

**(2)**

(b) Find the probability that Magnus gets a head and a 3.

.....  
**(1)**

35. Shown below are five cards which are arranged in order from smallest to largest



The range of the cards is 6.  
The median of the cards is 7.  
The mean of the cards is 8.

Work out the 4 missing numbers.

(4)

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36. The frequency table shows information about the amount of money withdrawn from an ATM by people on one day.

Money Withdrawn	Frequency
£10	16
£20	19
£30	4
£40	3
£50	6
£60	2

Write down the modal amount of money withdrawn.

£.....  
(1)

37. The table shows the ages of an under-21 rugby squad.

Age	Frequency
18	5
19	5
20	9
21	4

Find the median age.

.....  
**(1)**

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38. There are 40 houses in Greenvale and 60 houses in Redville.

The mean number of cars per house in Greenvale is 1

The mean number of cars per house in Redville is 2

Work out the mean number of cars per house in both villages.

.....  
**(3)**

39. The time for ten students to complete a race is below.

Time (t seconds)	Frequency
$20 < t \leq 40$	3
$40 < t \leq 60$	5
$60 < t \leq 80$	2

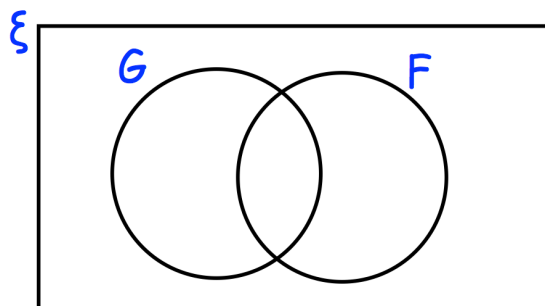
Work out an estimate for the mean time taken.

.....seconds  
(4)

40. There are 80 students in year 11.

- 9 students study French and German.
- 35 students only study French
- 2 students do not study French or German.

(a) Complete the Venn diagram



(2)

(b) Work out how many students study only German.

.....  
(1)

41. (a) Simplify

$$m^5 \times m^3$$

.....  
(1)

(b) Simplify

$$m^8 \div m^2$$

.....  
(1)

(c) Simplify

$$(m^3)^2$$

.....  
(1)

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42. Here are the first five terms of a number sequence.

9    15    21    27    33

(a) (i) Write down the next term of the number sequence.

.....  
(1)

(ii) Explain how you found your answer.

.....  
(1)

(b) Work out the 10th term of the sequence.

.....  
(1)

43. The first two terms of a geometric progression are 8 and 48

Work out the third term.

.....  
(2)

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44. Work out the  $n$ th term for this sequence

20    18    16    14    12    ...    ...

.....  
(2)

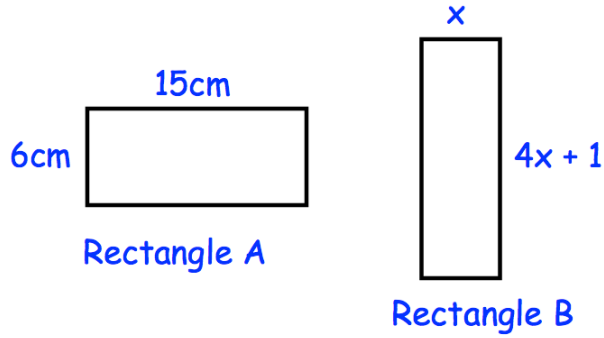
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45. Rebecca is  $x$  years old.  
Mary is 8 years older than Rebecca.  
Jill is three times older than Mary.  
The sum of their ages is 67.

Work out Mary's age.

.....  
(3)

46.



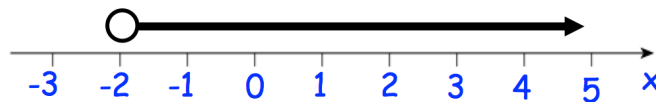
Both rectangles have the same perimeter.

Find the area of rectangle B.

.....cm<sup>2</sup>  
(5)

47. (a) Solve the inequality  $2x - 1 < 9$

.....  
(2)



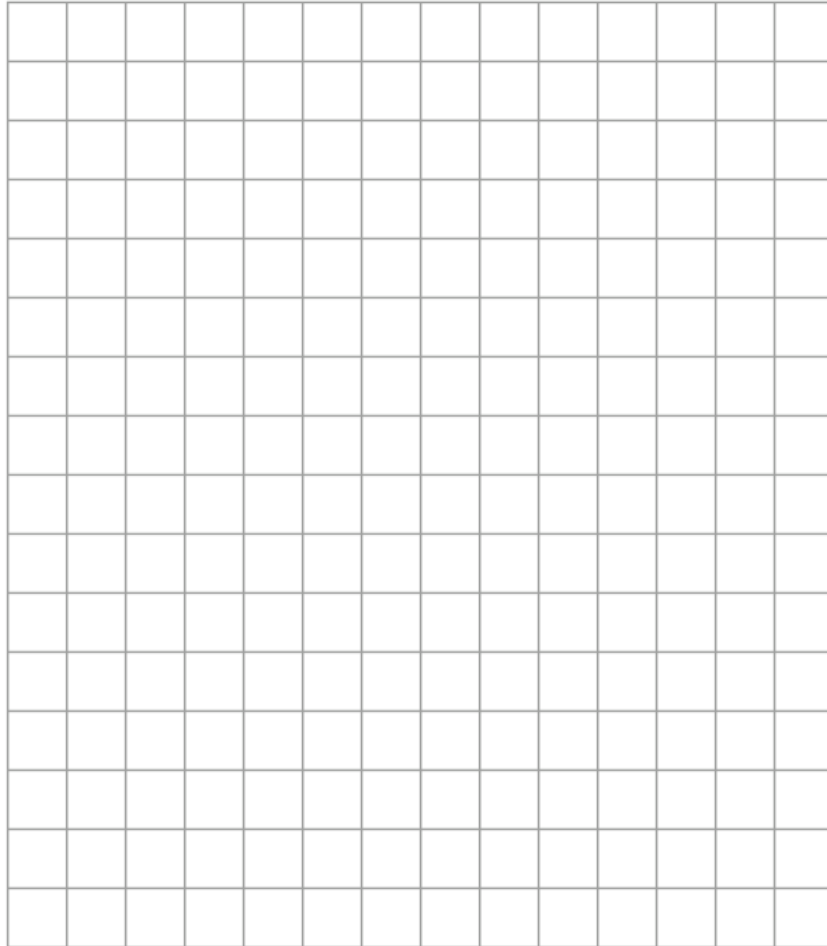
(b) Write down the inequality shown on the number line above

.....  
(1)

(c) Write down **all** the integers that satisfy both inequalities shown in part (a) and (b).

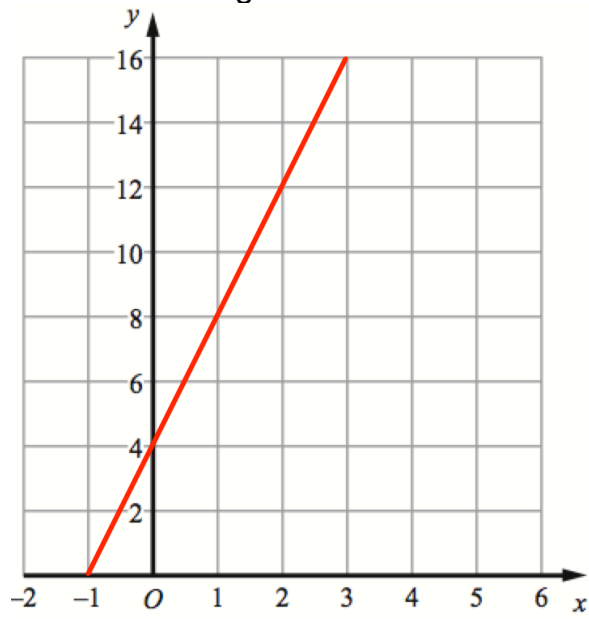
.....  
(1)

48. On the grid, draw  $y = 4x - 5$  for values of  $x$  from  $-2$  to  $2$ .



**(4)**

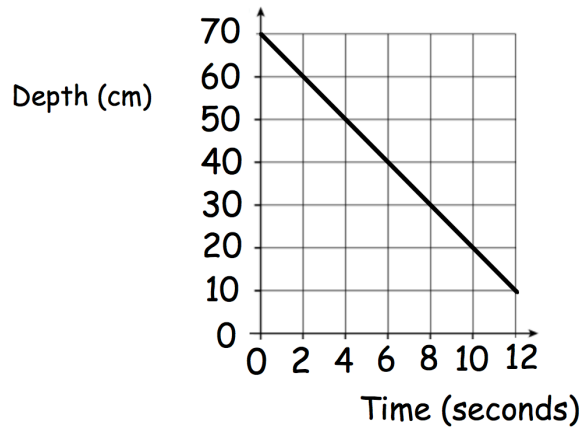
49. A straight line L is shown on the grid.



Work out the equation of line L

.....  
**(3)**

50. Beth has a full padding pool.  
The graph shows the depth of water in the pool ( $d$  cm) over time ( $t$  seconds)



The graph intersects the vertical axis at 70

- (a) What does this represent?

..... (1)

- (b) Find the gradient of the line.

..... (2)

- (c) Explain what the gradient represents.

..... (1)

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51.  $W = 6a - 2b$

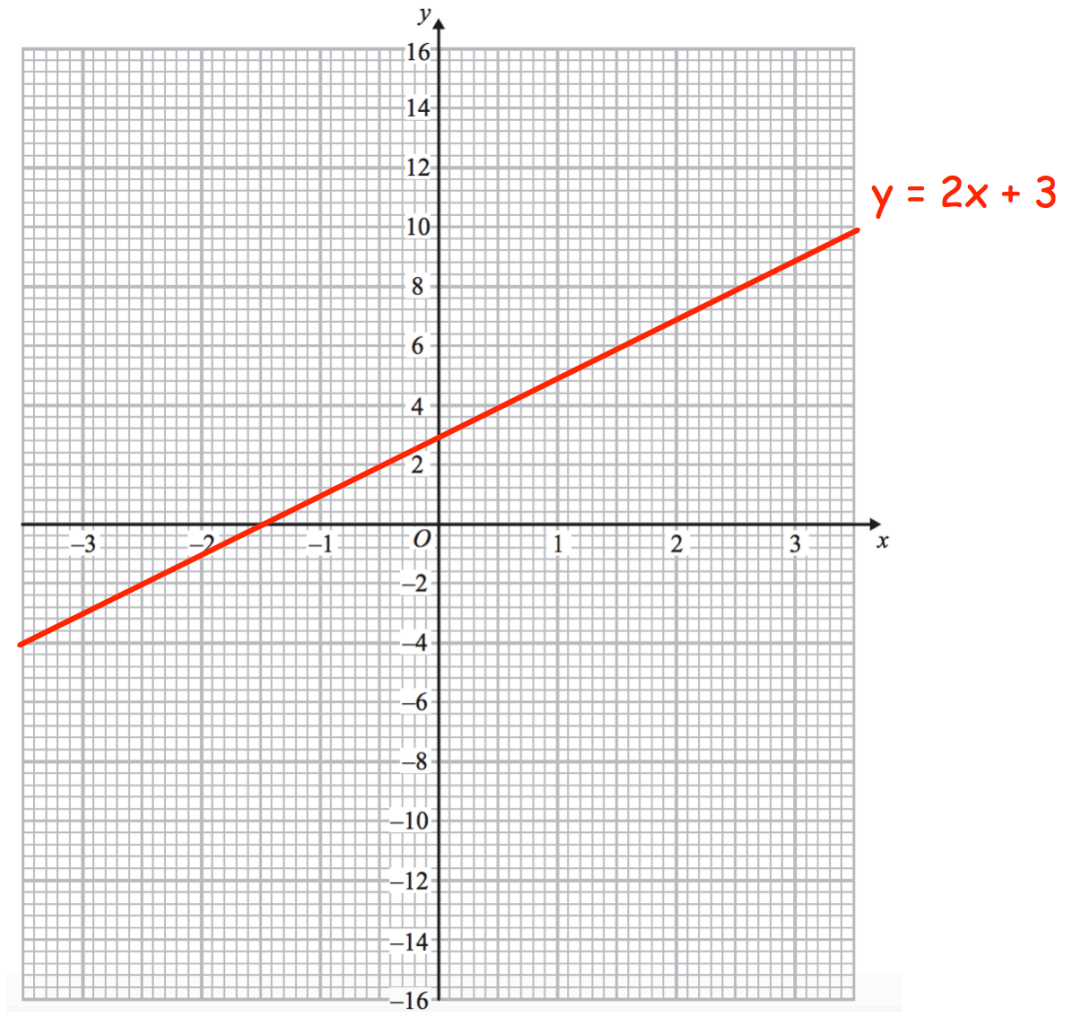
$$a = 3$$

$$b = -7$$

Work out the value of  $W$

..... (2)

52. The straight line  $y = 2x + 3$  has been drawn on the grid.



(a) On the same grid, draw the graph of  $y = -3x + 8$

(2)

(b) Write down the coordinates of the point where the graphs  $y = 2x + 3$  and  $y = -3x + 8$  intersect.

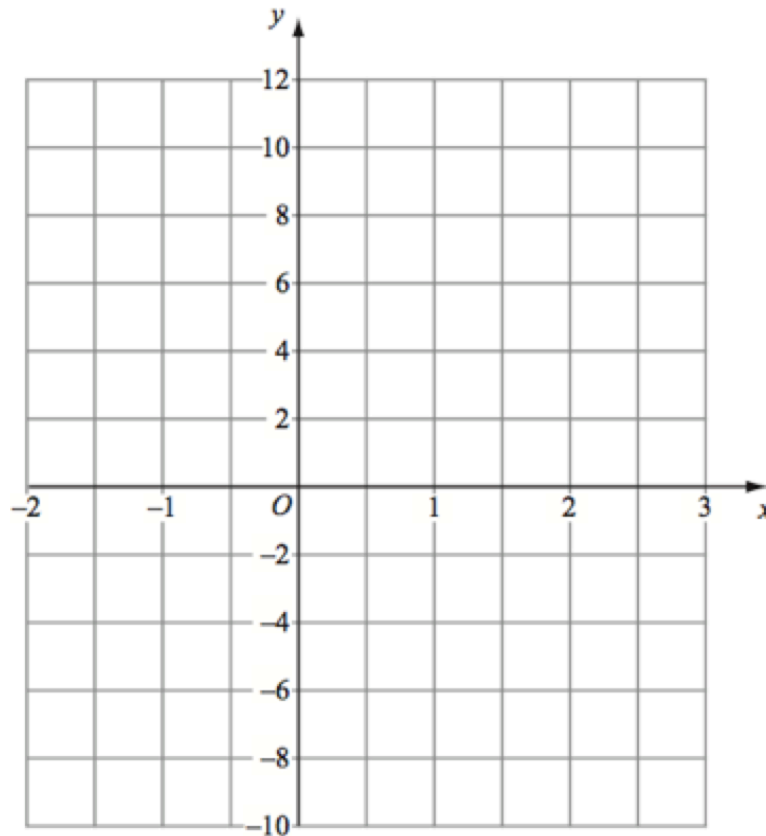
.....  
(1)

53. (a) Complete the table of values for  $y = (x - 1)^2$

x	-2	-1	0	1	2	3
y						

(2)

(b) On the grid, draw the graph of  $y = (x - 1)^2$  for the values of x from -2 to 3



(2)

(c) Use your graph to find estimates of the solutions to the equation  $(x - 1)^2 = 3$

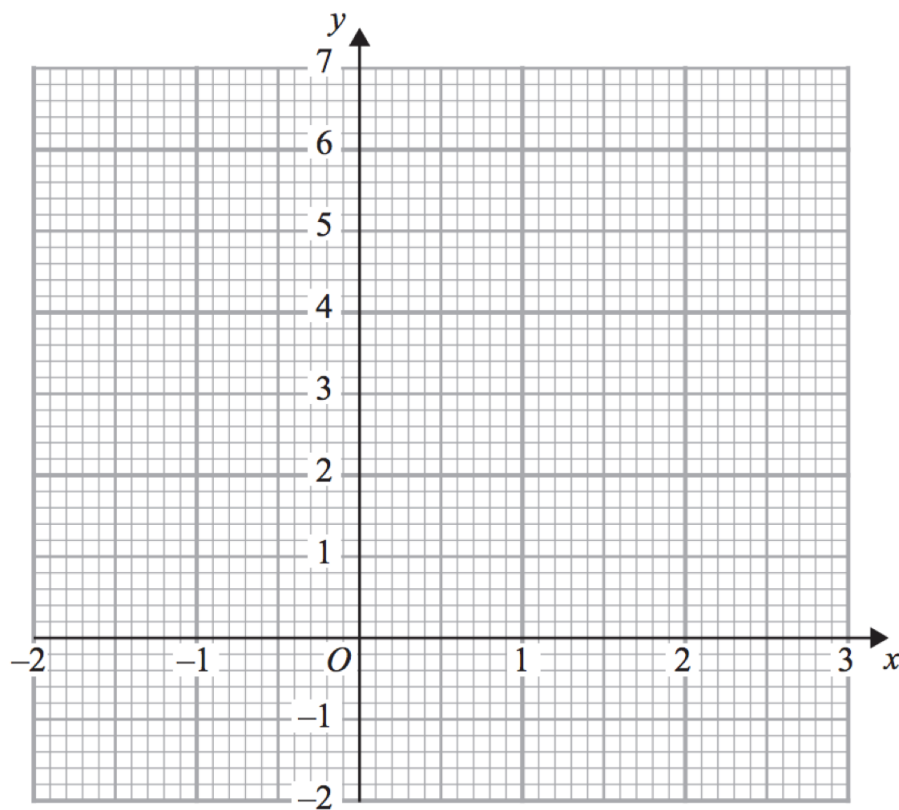
.....  
(2)

54. (a) Complete the table of values for  $y = x^3 - 2x + 3$

$x$	-2	-1	0	1	2
$y$					

(2)

(b) On the grid, draw the graph of  $y = x^3 - 2x + 3$  for the values of  $x$   $-2 \leq x \leq 2$



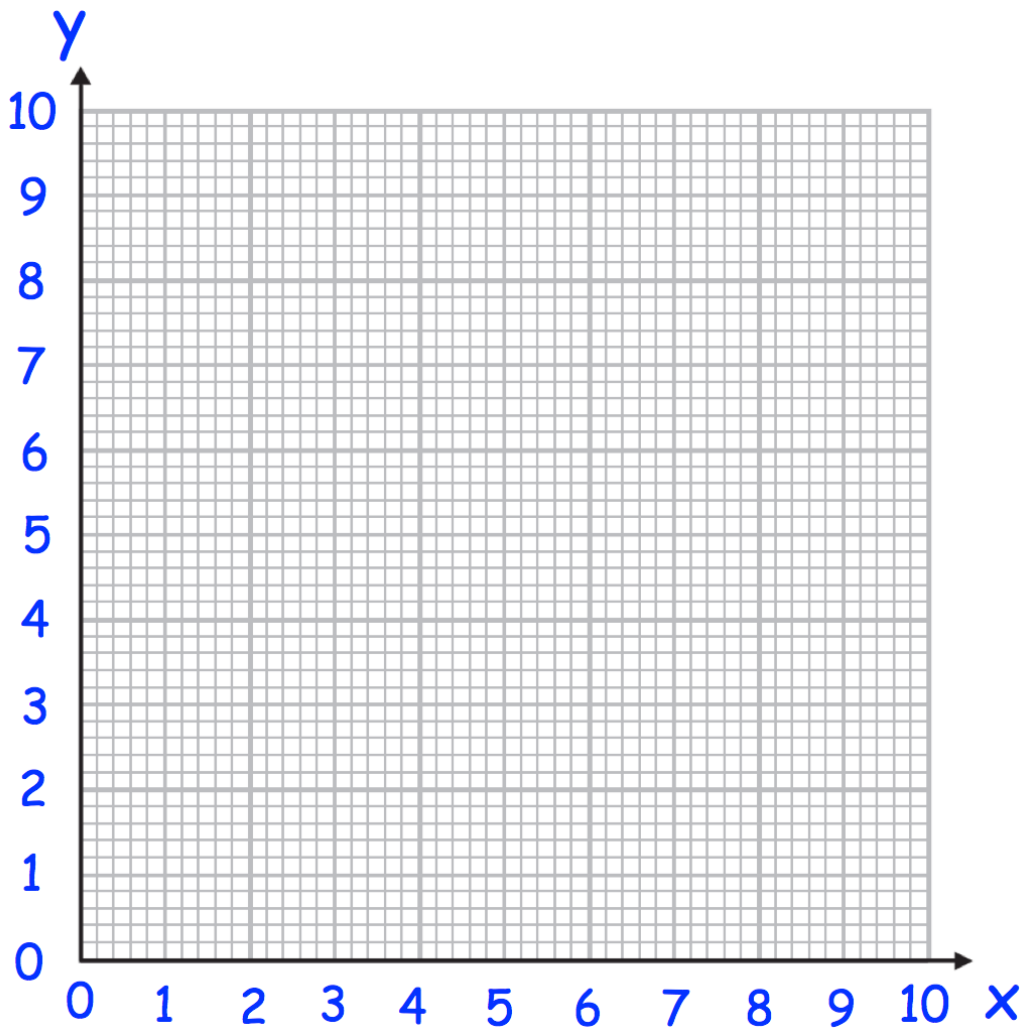
(2)

55. Complete the table of values for  $y = \frac{5}{x}$

$x$	0.5	1	2	4	8	10
$y$						

(2)

(b) On the grid, draw the graph of  $y = \frac{5}{x}$  for  $0.5 \leq x \leq 10$



(2)

56. In a class, some students have school dinners and the rest have packed lunch. The ratio of students that have school dinners to packed lunch is 4:1

What fraction of the class have school dinner?

.....  
(2)