GCSE Mathematics - Paper 1 (Foundation tier)

J560/01 Paper 1 Mathematics (Foundation tier)

Question Set 2

1 (a) Write down each of the following.

(i) An odd number.

(a)(i) ..... 1 ..... [1]

(ii) A factor of 25.

(ii) ..... 5 ..... [1]

(iii) A prime number between 20 and 30.

(iii) ..... 23 ..... [1]

(b) Show that 55 is **not** a square number. → $\sqrt{55} = 7.416198487$ [2]

not whole number so not square number

2 Here are the first four terms of a sequence.

3 8 13 18

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

$18 + 5 = 23$

(a)(i) ..... 23 ..... [1]

(ii) Explain how you worked out your answer.

Sequence going up in 5 so add 5 each time. [1]

(b) Explain why 534 is **not** a term in this sequence.

sequence formula is $5n - 2$

$5n - 2 = 534 \rightarrow 5n = 536$

$n = \frac{536}{5} = 107.2$

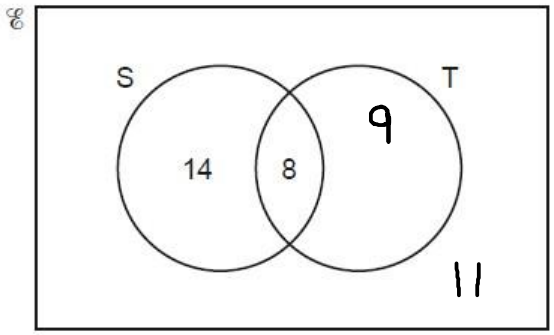
so not a term

..... [1]

3 A survey asked whether some students went swimming (S) or played tennis (T) last month.

- 17 played tennis.
- 11 did not go swimming and did not play tennis.
- 22 went swimming.
- 8 went swimming and played tennis.

Some of this information is shown on the Venn diagram below.



How many students were in the survey?

$14+8+9+11=42$

42 **[3]**

4 Mr and Mrs Wilde have five children who are all **different** ages.

- The mean age is 6.4.
- The range is 9.
- The median is 6.
- The oldest child is 12.

Work out the ages of the children.
Write their ages from youngest to oldest.

$6.4\times5=32$ total age

oldest $=12$ range $=9$ so youngest $=12-9=3$

3rd child is median which $=6$

3 4 6 7 12

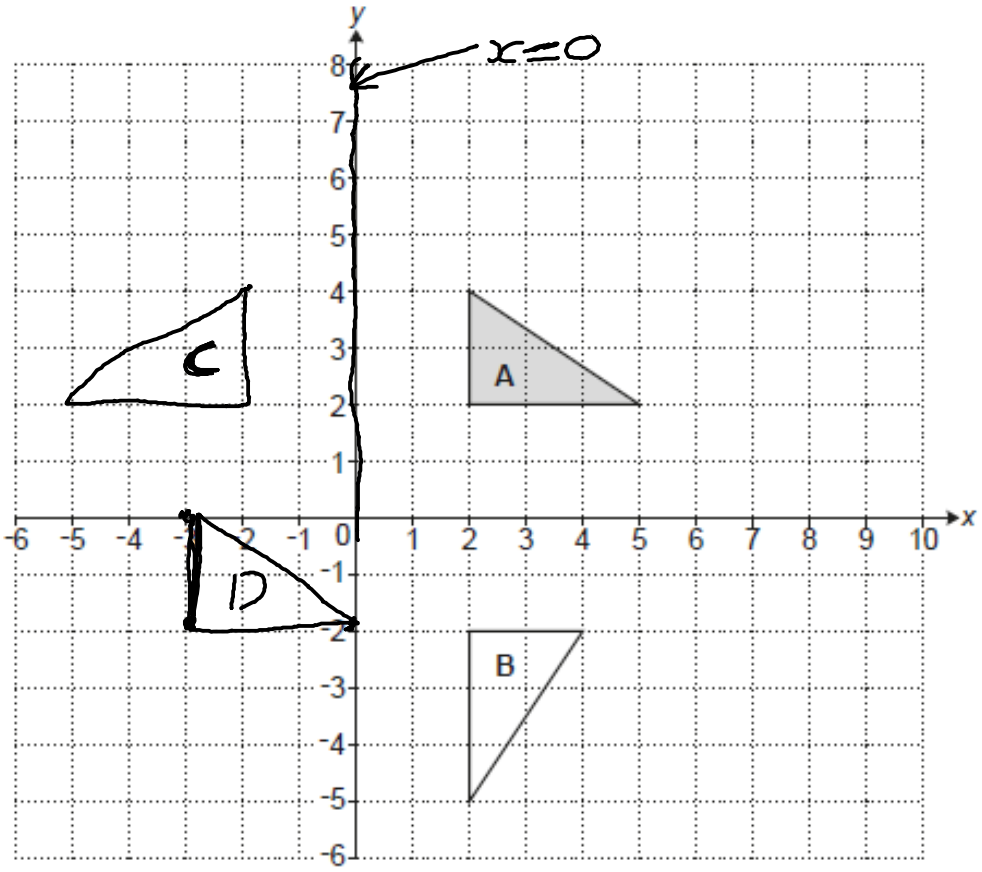
$32-(3+6+12)=11$
2nd and 4th $=11$ total

3 4 6 7 12

youngest *oldest*

[4]

5 Triangles **A** and **B** are drawn on the coordinate grid.



(a) Describe fully the **single** transformation that maps triangle **A** onto triangle **B**.

Rotate 90° clockwise at centre (0,0).

.....

.....

[3]

(b) **(i)** On the grid, reflect triangle **A** in the line $x = 0$.

Label the image **C**. **[2]**

(ii) On the grid, translate triangle **A** by vector $\begin{pmatrix} -5 \\ -4 \end{pmatrix}$.

Label the image **D**. **[2]**

Left 5 down 4

6 Jack and Alex take rubbish to be recycled.
Jack takes 520 kilograms, 87% of which can be recycled.
Alex takes 750 kilograms, 61% of which can be recycled.

Calculate who takes the greatest amount of rubbish that can be recycled and by how much.

Jack takes $520 \times \frac{87}{100} = 452.4$ kg can be recycled.

Alex takes $750 \times \frac{61}{100} = 457.5$ kg can be recycled.

So Alex takes more → $457.5 - 452.4 = 5.1$ kg

Alex by 5.1 kg [3]

7 Anna and Paddy take part in the same fun run.

Anna completed the fun run in 2 hours.
Her average speed was 6 kilometres per hour.
Paddy completed the fun run in 90 minutes.

(a) Work out Paddy's average speed in kilometres per hour.

$6 \times 2 = 12$ km run

90 min = 1.5 hours

$\text{speed} = \frac{D}{T}$

$\frac{12}{1.5} = 8$ km/h

(a) 8 km/h [4]

(b) Anna says

> Because I stopped for drinks, my average running speed was faster than 6 kilometres per hour.

Give one reason to support Anna's statement.

she would have taken less time if she didn't stop. [1]

8 The volume of a piece of wood is 620 cm^3.
Its density is 0.85 g/cm^3.

Work out its mass.

$m = D \times V \rightarrow 0.85 \times 620 = 527$ grams

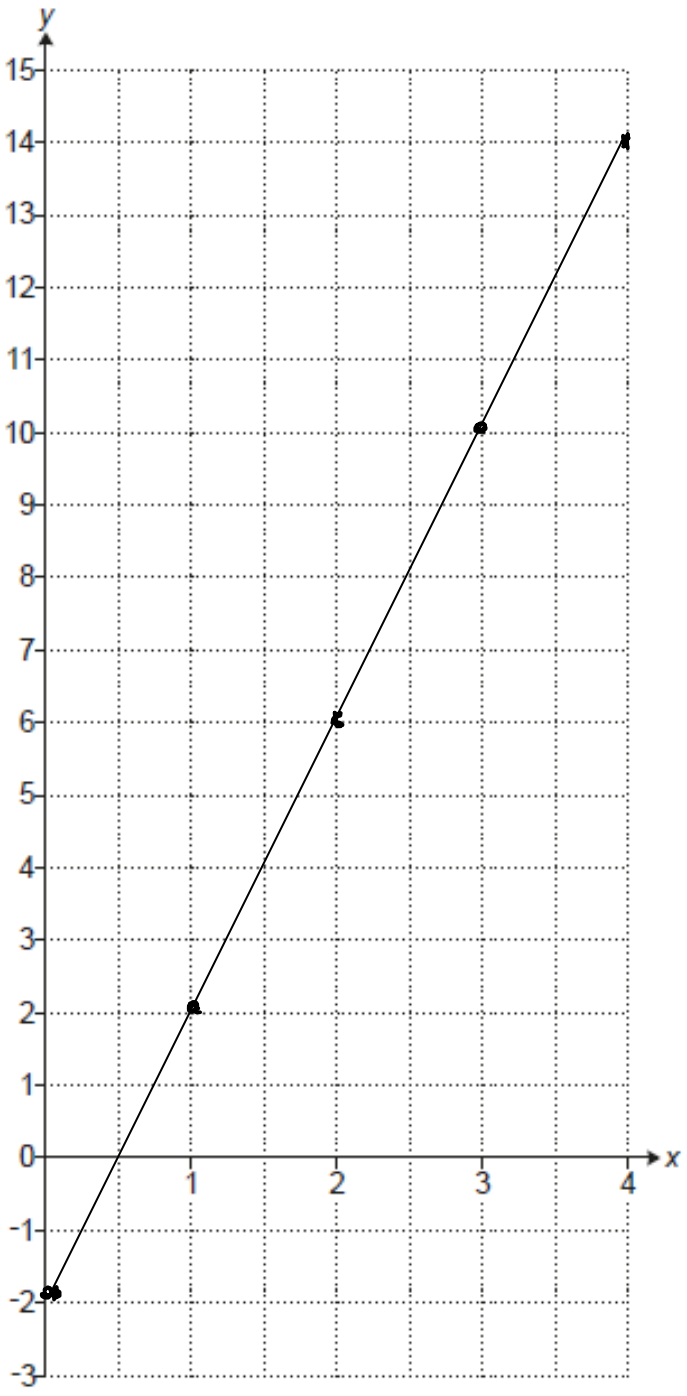
527 g **[2]**

9 **(a)** Complete this table for $y = 4x - 2$.

x	0	1	2	3	4
y	-2	2	6	10	14

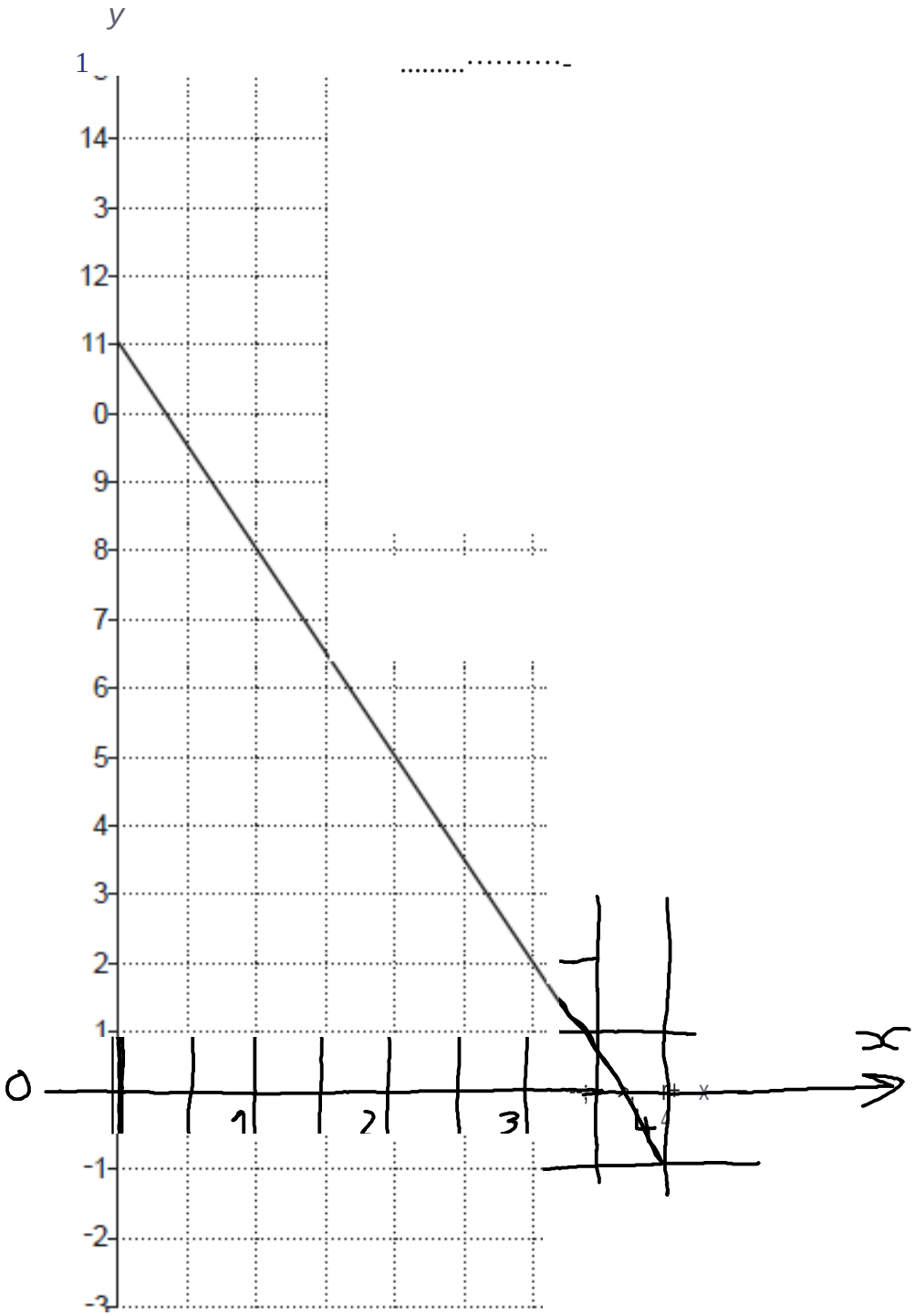
[1]

(b) On the grid below, draw the graph of $y = 4x - 2$ for values of x from 0 to 4.



[2]

The diagram below shows part of another stra;ght line.



Find the equation of this straight line.

(4, -1) (0, 11)

$\frac{11 - -1}{0 - 4} = \frac{12}{-4} = -3$ gradient

$y = -3x + c$

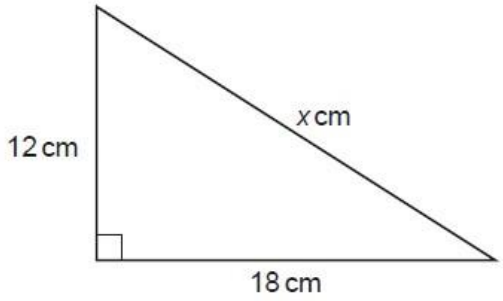
$11 = -3(0) + c$

$c = 11$

$y = -3x + 11$

(c) $y = -3x + 11$ [3]

10 Here is a right-angled triangle.



Not to scale

Work out the value of x.

$(12)^2 + (18)^2 = (x)^2$

$468 = (x)^2 \rightarrow x = \sqrt{468} = 6\sqrt{13}$

$x =$ $6\sqrt{13}$ [3]

11 James and Elizabeth buy some clothes.

James buys 5 shirts and 4 jumpers. He pays £163.
Elizabeth buys 3 shirts and 2 jumpers. She pays £89.

Assume that each shirt has the same cost and that each jumper has the same cost.

Work out the cost of one shirt and the cost of one jumper.
You must show your working.

make shirt $= x$ make jumper $= y$

① James → $5x + 4y = 163$
② Elizabeth → $3x + 2y = 89$

① $5x + 4y = 163$ —
2×② $6x + 4y = 178$

$-x = -15$
$x = 15$ = shirt

Take ② and sub in $x = 15$
$3(15) + 2y = 89$
$89 - 45 = 2y$
$44 = 2y \rightarrow y = 22$ = jumper

Cost of one shirt £ ..15..

Cost of one jumper £ ..22.. **[5]**

12 Claudia invests £25 000 at a rate of 2% per year compound interest.

Calculate the total amount of **interest** she will have earned after 5 years.
Give your answer correct to the nearest penny.

$25000 \times (1.02)^5 = 27602.02008$

$27602.02008 - 25000 = £2602.02$

£ ..2602.02.. **[4]**

Total Marks for Question Set 2: 50