

The Lowry Academy



The best in everyone™

Name: _____

Year 10 Higher

End of Year Assessment Revision Resource

Part 1: Topics & Hegarty Maths Clips

Part 2: Practice Questions

Topics & Hegarty Maths Clips

Topic	Strand	Hegarty Maths clips
Rearrange formulae	Algebra	280-86
Linear Graphs	Algebra	199-200, 205 - 213
$y = mx + c$	Algebra	206-16
Compound Measures	Ratio, Proportion & Rates of Change	716-19, 734-6, 725-32
Quadratic graphs, turning points, and roots	Algebra	251-258
Further expanding & factorising	Algebra	166, 228
Linear Simultaneous Equations	Algebra	190-195
Further graphs	Algebra	299-205
Probability	Probability	351-90
Capture & Recapture	Statistics	872-3
Standard Form	Number	122-9
Proportion (further)	Ratio, Proportion & Rates of Change	343-7
Simple interest	Ratio, Proportion & Rates of Change	93
Growth & Decay	Ratio, Proportion & Rates of Change	94, 800-11,
Ratio (further)	Ratio, Proportion & Rates of Change	330-7
Recurring decimals	Number	53-4
Statistics - no higher	Statistics	393-4, 413-21, 453-4
Surds	Number	111-19
Bounds	Number	137-9

Practice Questions

Q1.

Work out $2\frac{1}{8} - \frac{2}{3}$

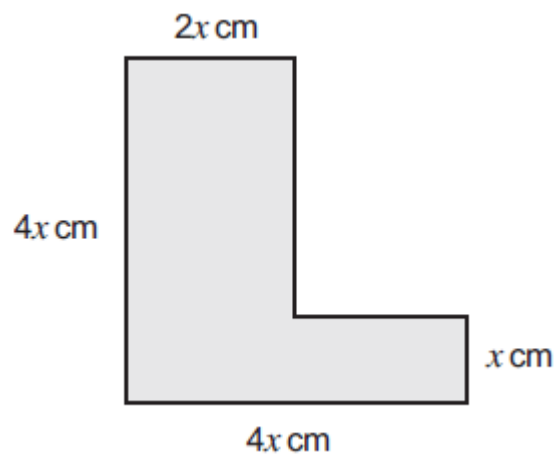
Answer _____

(Total 3 marks)

Q2.

The perimeter of this L-shape is 56 cm.

Not drawn accurately



Set up and solve an equation to work out the value of x .

$x =$ _____

(Total 4 marks)

Q3.

Given $5y + 4 = ay$

Work out the value of a when $y = 2$

$a = \underline{\hspace{10cm}}$

(Total 2 marks)**Q4.**

The equations of five straight lines are given below.

The line $y = 3x - 1$ is parallel to two of the lines.Circle the equations of these **two** lines.

$y = 3x$

$y = -1$

$y = -3x - 1$

$y = 2x - 1$

$y = 3x + 1$

(Total 2 marks)**Q5.**

The height of a tree is 12 metres, correct to the nearest metre.

Circle the error interval.

$11.5 \text{ m} \leq \text{height} < 12.5 \text{ m}$

$11.5 \text{ m} \leq \text{height} \leq 12.5 \text{ m}$

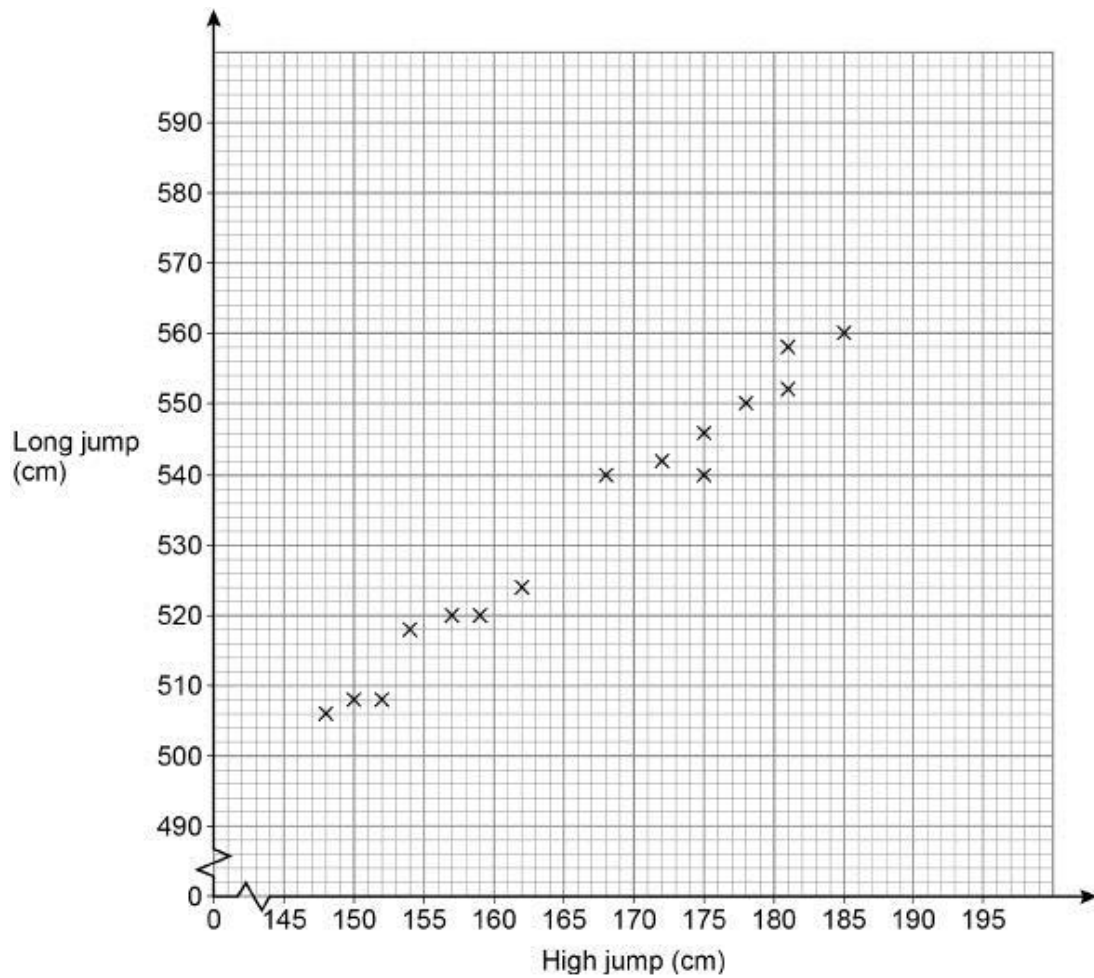
$11.5 \text{ m} < \text{height} \leq 12.5 \text{ m}$

$11.5 \text{ m} < \text{height} < 12.5 \text{ m}$

(Total 1 mark)

Q6.

The scatter graph shows the best high jump and the best long jump for 15 boys.



(a) Write down the type of correlation shown.

Answer _____

(1)

(b) Liam has a best high jump of 166 cm

Use a line of best fit to estimate his best long jump.

Answer _____ cm

(2)

(c) Another boy has a best high jump of 195 cm

Give a reason why you should **not** use a line of best fit to estimate his best long jump.

(1)

(Total 4 marks)

Q7.

Increase 4200 by 38% **CALCULATOR ALLOWED**

Answer _____

(Total 2 marks)

Q8.

Solve $5x - 2 > 3x + 11$

Answer _____

(Total 2 marks)

Q9.

The first 4 terms of a linear sequence are

3

11

19

27

Circle the expression for the n th term.

$8 - 5n$

$n + 8$

$8n + 3$

$8n - 5$

(Total 1 mark)

Q10.

A menu has a choice of 3 starters, 5 main courses and 4 desserts.

How many different choices of a 3-course meal are possible?
Circle your answer.

12

23

60

972

(Total 1 mark)

Q11.

Expand and simplify $(2x + 5)(2x - 5)(3x + 7)$

Answer _____

(Total 3 mark)

Q12.

Write 360 000 in standard form.

Answer _____

(Total 1 mark)

Q13.

The exterior angle of a regular polygon is 45°

Circle the name of the regular polygon.

pentagon

hexagon

octagon

decagon

(Total 1 mark)

Q14. CALCULATOR ALLOWED

David invests £5000 in a savings account.

The account pays 3.2% compound interest per year.

Work out the value of his investment after 3 years.

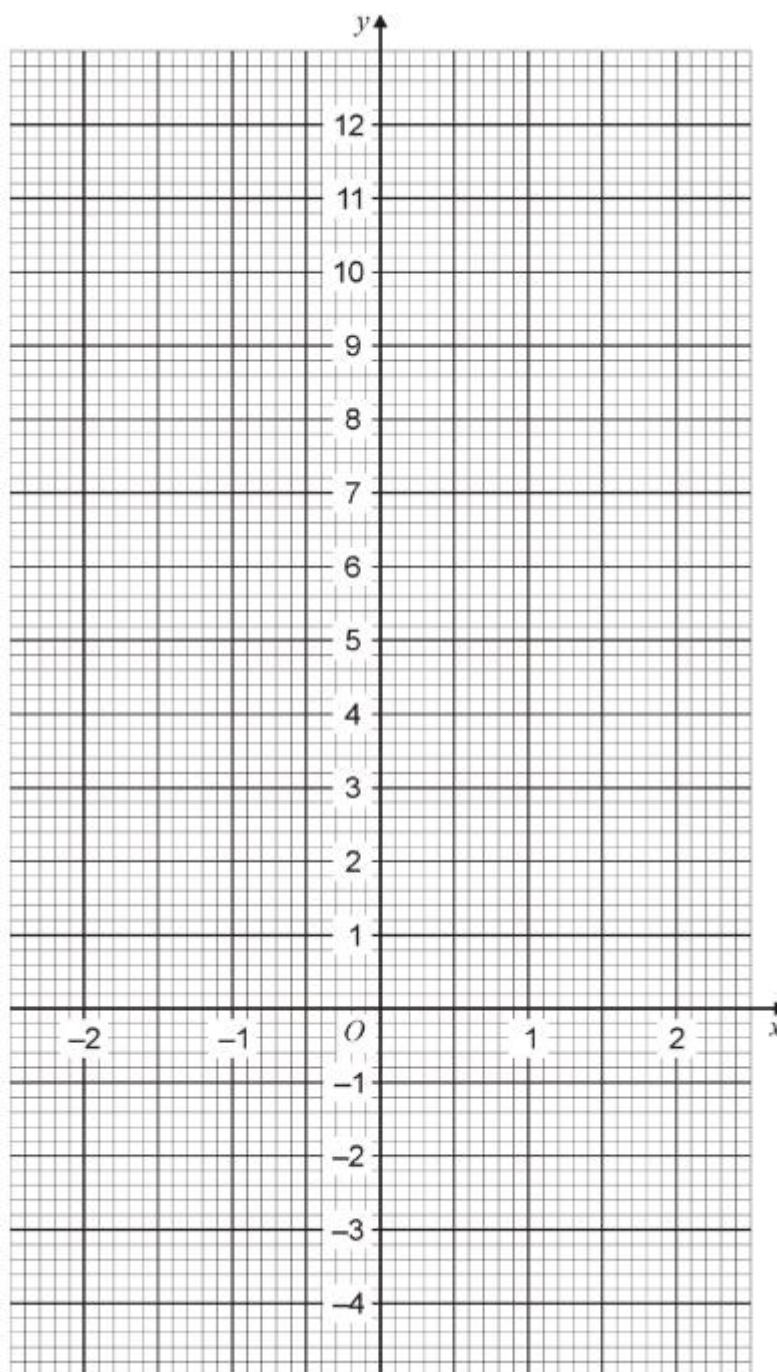
Give your answer to the nearest penny.

Answer £ _____

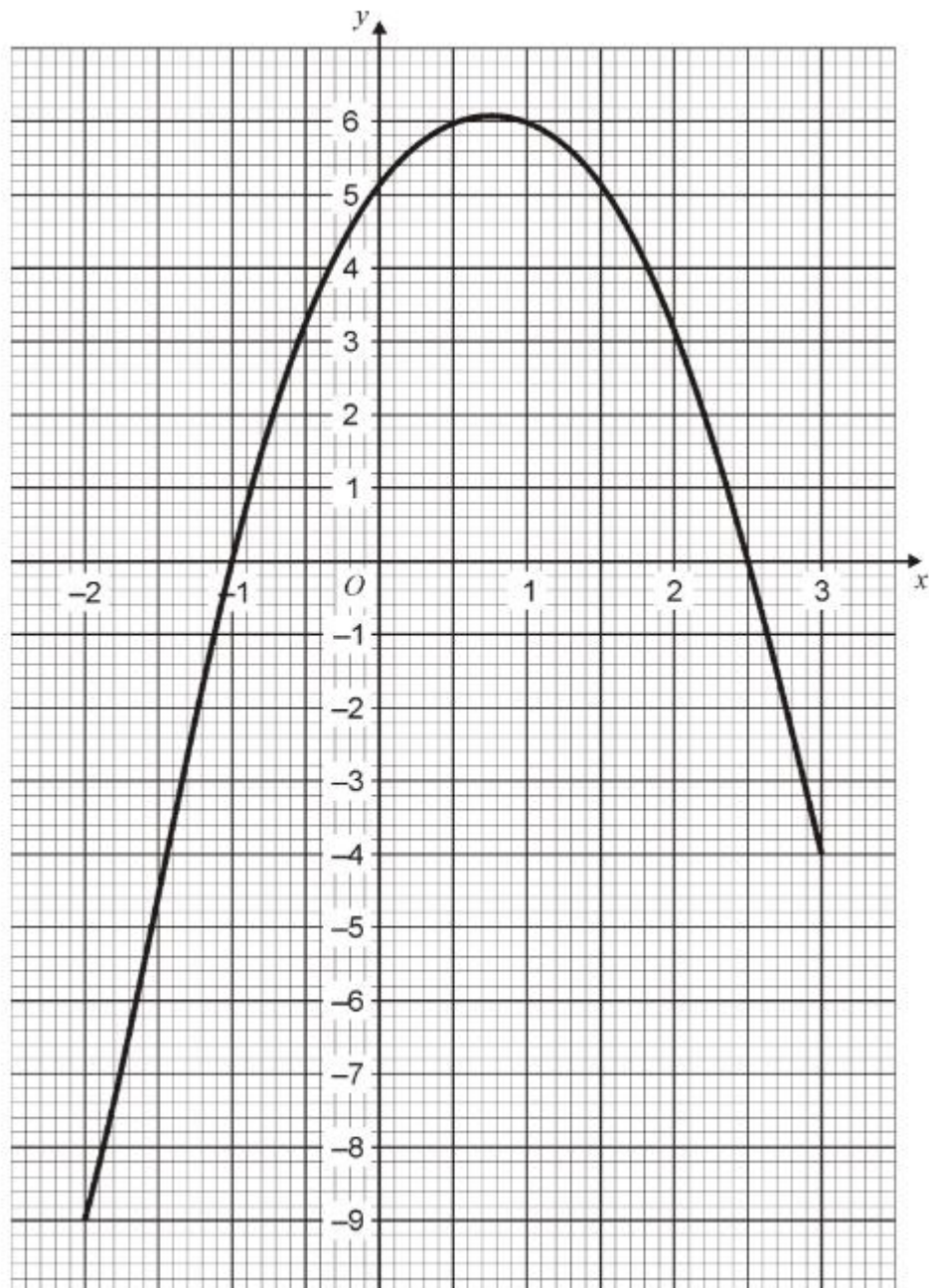
(Total 4 marks)

Q15.Complete the table of values for $y = x^3 + 4$

x	-2	-1	0	1	2
y		3	4		12

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

(c) The graph of $y = 5 + 3x - 2x^2$ is shown for values of x from -2 to 3



Write down the solutions of $5 + 3x - 2x^2 = 0$

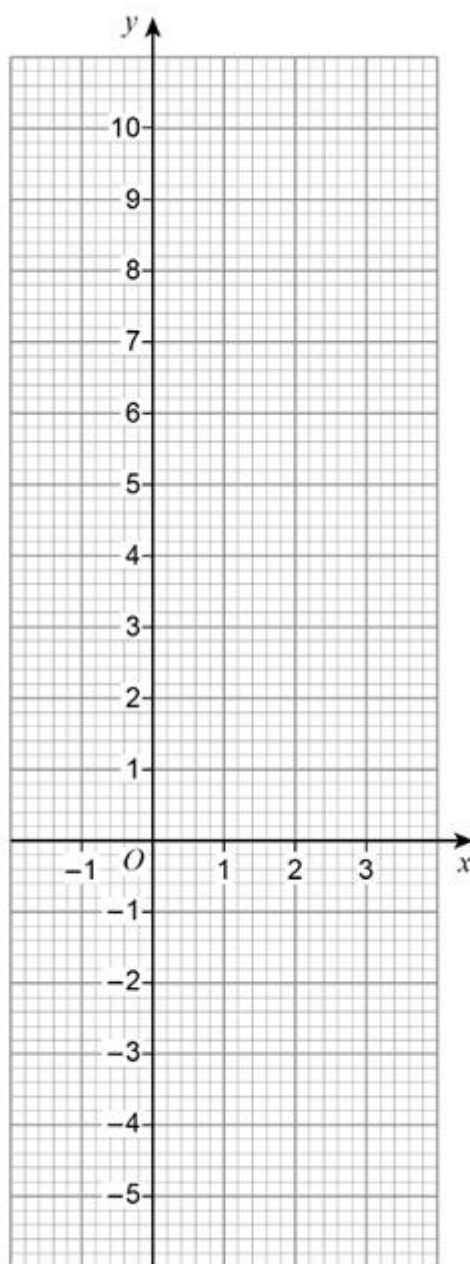
Answer _____ and _____

(2)

(Total 6 marks)

Q16.

Draw the graph of $y = 3x - 1$ for values of x from -1 to 3

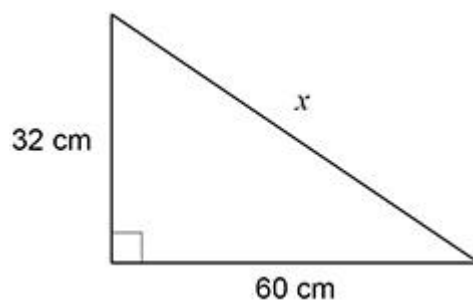


(Total 3 marks)

Q17. CALCULATOR ALLOWED

Use Pythagoras' theorem to work out the value of x .

Not drawn accurately



Answer _____ cm

(Total 3 marks)

Q18.

Expand and simplify $3(2x - 5) + 4(2x + 1)$

Answer _____

(Total 2 marks)

Q19.

Solve the simultaneous equations

$$7x + 2y = 36$$

$$3x + 2y = 16$$

$$x = \underline{\hspace{2cm}} \quad y = \underline{\hspace{2cm}}$$

(Total 3 marks)

Q20.

Rearrange $y = \frac{3x-2}{x+1}$ to make x the subject.

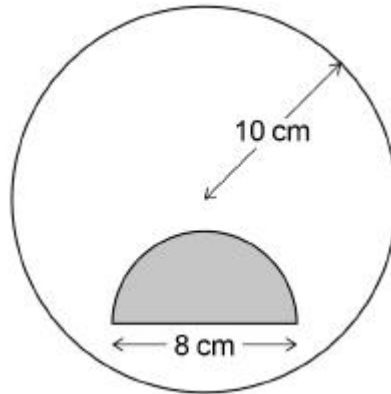
Answer $\underline{\hspace{4cm}}$

(Total 4 marks)

Q21. CALCULATOR ALLOWED

A shaded semicircle is inside a circle as shown.

Not drawn accurately



The **radius** of the circle is 10 cm

The **diameter** of the semicircle is 8 cm

How many times bigger is the unshaded area than the shaded area?

Answer _____

(Total 4 marks)

Q22.

Written as the product of its prime factors

$$672 = 2^5 \times 3 \times 7$$

- (a) Write 252 as the product of its prime factors.

Answer _____

(2)

- (b) Work out the value of the highest common factor of 672 and 252

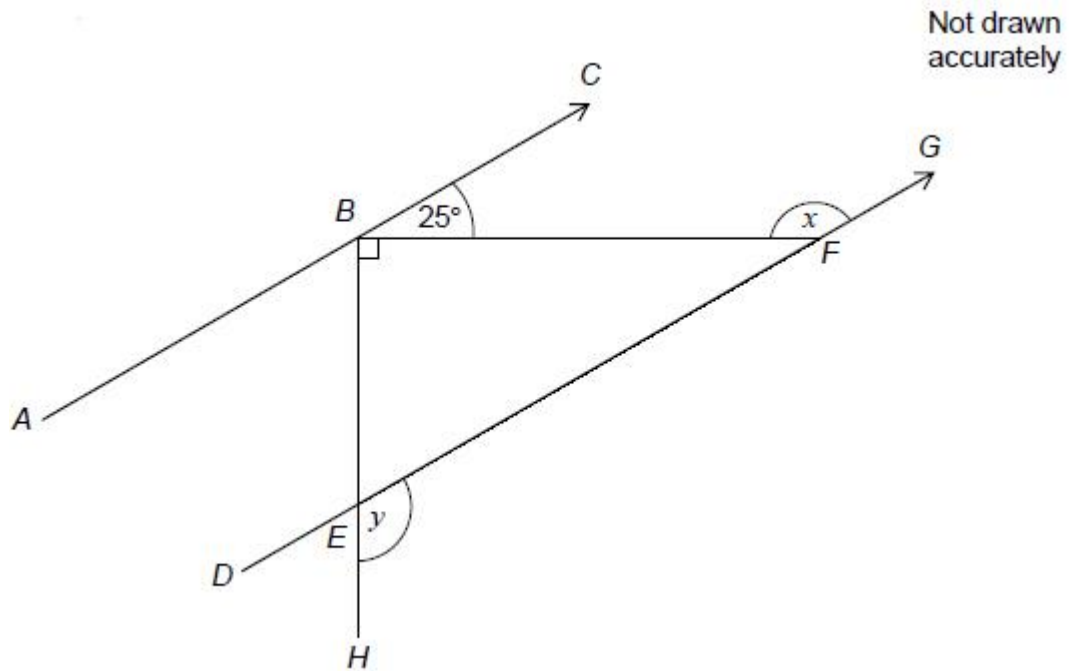
Answer _____

(1)

(Total 3 marks)

Q23.

ABC and $DEFG$ are parallel lines.
 BEH is a straight line.



- (a) Work out the size of angle x .

Answer _____ degrees

(1)

- (b) Work out the size of angle y .
You **must** show your working, which may be on the diagram.

Answer _____ degrees

(2)

(Total 3 marks)

Q24.

The table shows information about journeys A and B.

Complete the table.

	Distance travelled	Time taken	Average speed
A	32 miles		64 mph
B		1 hour 20 minutes	42 mph

(Total 2 marks)

Q25. CALCULATOR ALLOWED

R is inversely proportional to A .

$$R = 12.1 \text{ when } A = 1.5$$

- (a) Work out a formula connecting R and A .

Answer _____

(3)

- (b) Work out the value of R when $A = 4$

Answer _____

(2)

(Total 5 marks)

Q26.

Show that $\frac{14}{\sqrt{7}}$ can be written in the form $a\sqrt{b}$ where a and b are integers.

(Total 2 marks)

Q27.

Work out $8\frac{1}{2} \div 2\frac{2}{3}$

Give your answer as a mixed number.

Answer _____

(Total 4 marks)

Q28.

Work out $64^{\frac{2}{3}}$

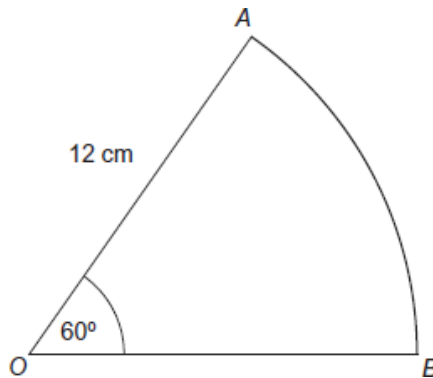
Answer _____

(Total 2 marks)

Q30. CALCULATOR ALLOWED

OAB is a sector of a circle of radius 12 cm
Angle $AOB = 60^\circ$

Not drawn accurately



Work out the length of the arc AB .
Give your answer in terms of π .

Answer _____ cm

(Total 2 marks)

Q31. CALCULATOR ALLOWED

$$m = \frac{p - 2b}{2}$$

$p = 68.3$ correct to 1 decimal place.

$b = 8.7$ correct to 1 decimal place.

Work out the lower bound for m .

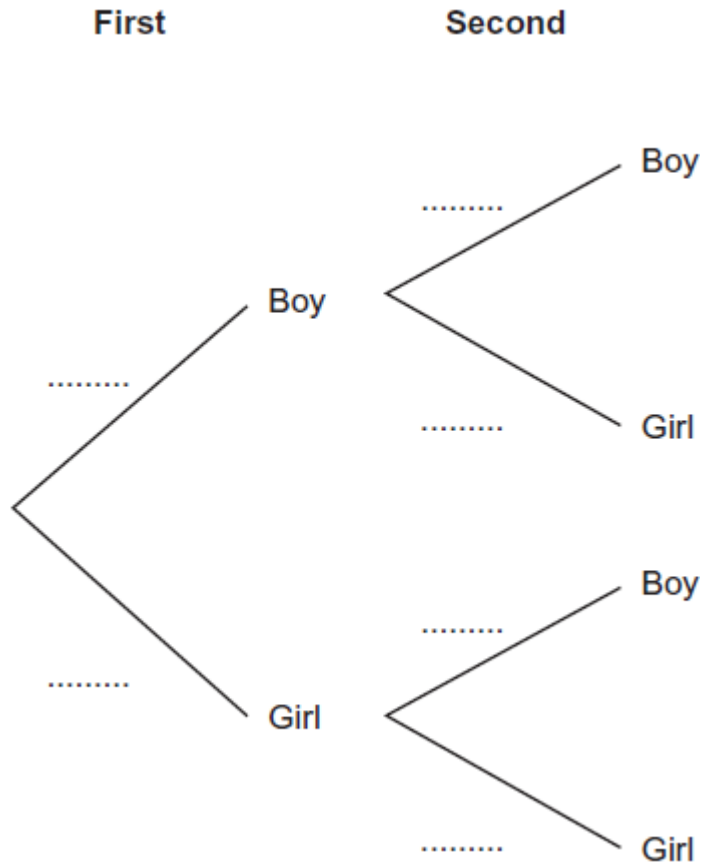
Answer _____

(Total 3 marks)

Q32.

A team has 7 boys and 3 girls.
Stevie chooses two of the team at random.

(a) Complete the probability tree diagram.



(3)

(b) Work out the probability that he chooses one boy and one girl.

Answer _____

(3)

(Total 6 marks)

Q33.

John goes to work by car or by train.

- (a) The probability that John goes by car is 0.4

Work out the probability he goes by train.

Answer _____

(1)

- (b) John works for 200 days each year.

How many days would you expect him to go to work by car?

Answer _____

(2)

- (c) Ben also goes to work by car or by train.
Out of 200 days, he went by car on 150 days.

Work out the relative frequency that Ben goes to work by car.

Answer _____

(1)

(Total 4 marks)

Q36.

Express $0.\dot{5}$ as a fraction in its simplest form. You must show your working.

Answer _____

(Total 3 marks)

Q37.

The mean mass of a squad of 19 hockey players is 82 kg

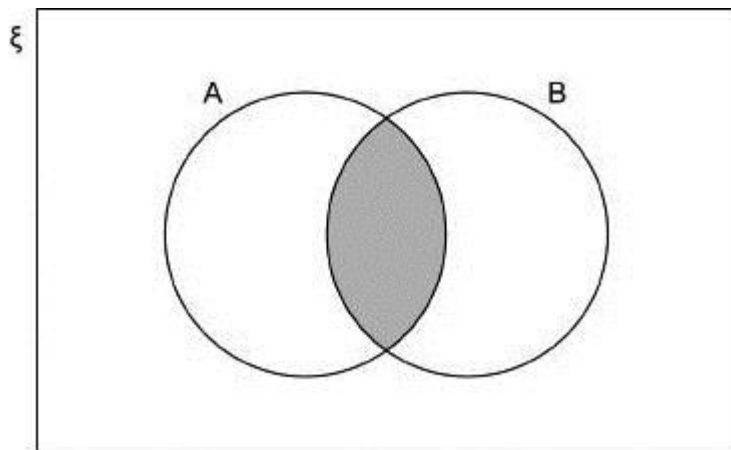
A player of mass 93 kg joins the squad.

Work out the mean mass of the squad now.

Answer _____ kg

(Total 3 marks)

Q38.



Which of these represents the shaded region?

Circle your answer.

$A \cup B$

$(A \cap B)'$

$A \cap B$

$A' \cup B'$

(Total 1 mark)

Answers

1	$\frac{35}{24}$ or $1\frac{11}{24}$ oe
2	3.5 or $\frac{7}{2}$ or $3\frac{1}{2}$
3	7
4	$y = 3x$ and $y = 3x + 1$
5	$11.5 \text{ m} \leq \text{height} < 12.5 \text{ m}$
6	(a) Positive (b) Straight line of best fit passing through (150, [504, 512]) and (180, [550, 558]) (c) Examples reasons: <i>195 cm is outside the range of values</i> <i>You cannot extrapolate</i>
7	5796
8	$x > 6.5$
9	$8n - 5$
10	60
11	$12x^3 + 28x^2 - 75x - 175$
12	3.6×10^5
13	octagon
14	5495.52
15	(a) -4 and 5 (b) 5 correctly plotted coordinates Smooth curve passing through your 5 points (c) -1 and 2.5
16	Coordinates: (-1, -4), (0, -1), (1, 2), (2, 5) and (3, 8) Straight, ruled line from (-1, -4) to (3, 8)

17	68
18	$14x - 11$
19	$y = 0.5$ $x = 5$
20	$x = \frac{-y-2}{y-3}$ or $x = \frac{y+2}{3-y}$
21	$11\frac{1}{2}$ or 11.5
22	(a) $2 \times 2 \times 3 \times 3 \times 7$ or $2^2 \times 3^2 \times 7$ (b) 84
23	(a) 155 (b) 115
24	30 minutes or $\frac{1}{2}$ hour 56 (miles)
25	(a) $R = \frac{18.15}{A}$ or $R = \frac{1}{0.055A}$ (b) $4.5(375)$
26	$2\sqrt{7}$
27	$3\frac{3}{16}$
28	16
29	12.5
30	4π or [12.56, 12.6] or $\pi 4$

31	25.375 or $\frac{203}{8}$ or $25\frac{3}{8}$
32	<p>(a)</p> <p style="margin-left: 100px;">Second: $\frac{6}{9}$</p> <p style="margin-left: 50px;">First: $\frac{7}{10}$</p> <p style="margin-left: 100px;">Second: $\frac{3}{9}$</p> <p style="margin-left: 100px;">Second: $\frac{7}{9}$</p> <p style="margin-left: 50px;">First: $\frac{3}{10}$</p> <p style="margin-left: 100px;">Second: $\frac{2}{9}$</p> <p>(b)</p> <p style="margin-left: 100px;">$\frac{42}{90}$ or $\frac{21}{45}$ or $\frac{7}{15}$ or</p> <p style="margin-left: 100px;">0.4$\dot{6}$ or 0.47</p>
33	<p>(a) 0.6 or 60% or $\frac{6}{10}$</p> <p>(b) 80</p> <p>(c) 0.75 or 75% or $\frac{150}{200}$</p>
34	<p>Working: $x^2 - 2x + 7x + 28 = x^2 + 4x - 2x - 8$</p> <p>Answer: -12</p>
35	<p>(a) $(x - 4)(x - 5)$</p> <p>(b) 4 and 5</p>
36	$\frac{5}{9}$
37	82.55 or 82.6
38	$A \cap B$