

ISEB Assessments

Year 8 Level 3 Maths Test 3

Author: ISEB



This test contains a selected set of 10 questions in a particular topic order.

- 100 marks are available in total.
- You should take no more than 1 hour to complete the test.
- Write your answers in the spaces provided.
- Always write down your working, except when you are told not to.
- Calculators are not allowed.

SAMPLE

NOTE TO TEACHERS

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Year 8 Level 3 Maths Test 3

1. Evaluate:

(a) $1.45 + 3.7 - 4.2$

Answer: (2)

(b) 3.5×4.8

Answer: (2)

(b) $1\frac{1}{3} - \frac{7}{8}$

Answer: (2)

(c) $3\frac{5}{8} + 2\frac{2}{5} - 2\frac{3}{8}$

Answer: (4)

2. (a) Mr Jones bought a Ming vase for £1200

He then sold it to a dealer, making a 25% profit on his buying price.

(i) Calculate his selling price.

Answer: £ (2)

The vase was later sold by the dealer for £3600

(ii) What percentage profit did the dealer make on the sale?

Answer: % (2)

(iii) By what percentage has the price of the vase increased since Mr Jones first bought it?

Answer: % (2)

(b) Mike and Emma always share sweets in the ratio 3 : 4

(i) If Mike receives 6 sweets, how many does Emma receive?

Answer: sweets (1)

(ii) If Emma receives 3 more sweets than Mike, how many does Mike receive?

Answer: sweets (2)

(iii) If there are 30 sweets in a packet, how many does each person receive?

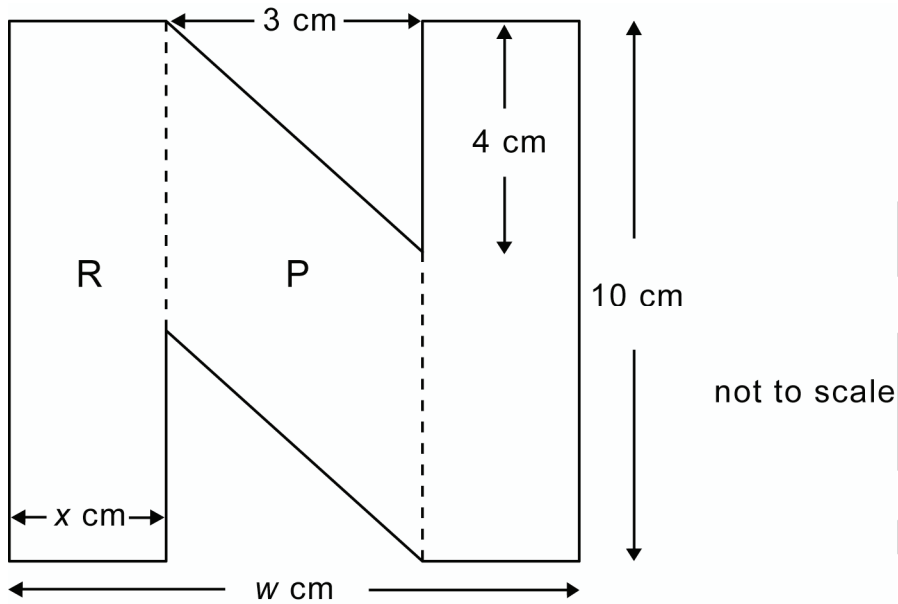
How many will be left over?

Answer: Mike , Emma , left over (1)

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3. Nancy has cut out her initial, N, from a rectangular piece of card 10 cm in height.

Her letter N, which has rotational symmetry of order 2, is shown below.



(i) Find the formula for the width, w , in terms of x , of the letter.

Answer: $w = \dots\dots\dots$ cm (2)

(ii) Find the area, in terms of x , of the rectangle labelled R in the diagram.

Answer: $\dots\dots\dots$ cm² (1)

(iii) Find the area of the parallelogram labelled P in the diagram.

Answer: $\dots\dots\dots$ cm² (2)

(iv) Find the total area, in terms of x , of Nancy's initial.

Answer: cm^2 (2)

The area of the letter N is 48 cm^2 .

(v) (a) Form an equation and solve it to find the value of x .

Answer: $x =$ (2)

(b) Use your value of x to find the width, w , of Nancy's initial.

Answer: cm (1)

SAMPLE

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4. At a fair, Bert sold cups of coffee and cups of tea.

He sold c coffees at 70 pence each and t teas at 60 pence each.

At the end of the fair he had sold 150 drinks and had taken a total of £97.00

(i) Form separate equations, in terms of c and t , to represent:

(a) the total number of drinks sold

Answer: (1)

(b) the total takings from the sale of the drinks.

Answer: (2)

(ii) Solve the equations in part (i) simultaneously.

Answer: $c = \dots\dots\dots$, $t = \dots\dots\dots$ (4)

(iii) How much money was taken from the sale of cups of:

(a) tea

Answer: £ (1)

(b) coffee?

Answer: £ (1)

(iv) Write the ratio, in its simplest form,
number of cups of coffee sold : number of cups of tea sold

Answer: : (1)

5. (a) Simplify the following algebraic expressions:

(i) $3ab - 4ab + 5ab$

Answer: (1)

(ii) $\frac{3c \times 4c}{8c}$

Answer: (2)

(iii) $2(3d - 2) - 3(d - 3)$

Answer: (2)

Turn over to the next page for question 5 (b)

(b) Here is a sequence of numbers:

3, 11, 19, 27, ...

Find:

(i) the next two terms

Answer: (1)

(ii) the 20th term

Answer: (2)

(iii) the n th term

Answer: (2)

6. (a) Solve these equations:

(i) $2x = 45 - 4x$

Answer: $x =$ (2)

(ii) $12 = \frac{3(y - 5)}{2}$

Answer: $y =$ (2)

(iii) $2(z - 3) = 3(2z + 8)$

Answer: $z = \dots\dots\dots$ (2)

(b) If $p = 2$, $q = -3$, $r = 0$ and $s = 4$, find the value of:

(i) $p - q$

Answer: $\dots\dots\dots$ (1)

(ii) p^3q^3r

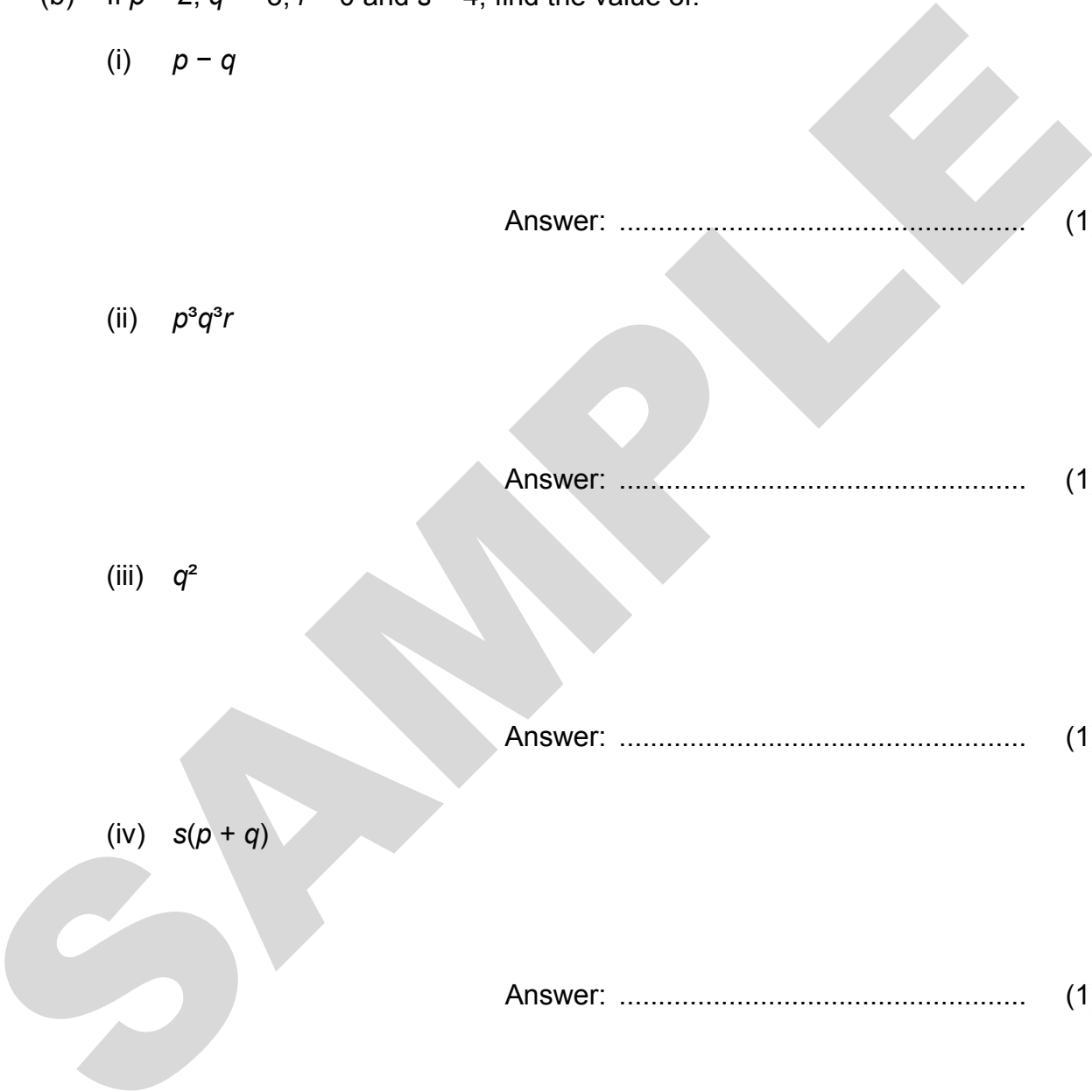
Answer: $\dots\dots\dots$ (1)

(iii) q^2

Answer: $\dots\dots\dots$ (1)

(iv) $s(p + q)$

Answer: $\dots\dots\dots$ (1)



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7. (a) (i) Solve the inequality $3x + 4 \leq 19$

Answer: (2)

(ii) If x is a positive integer, write down all integers greater than 2 which satisfy the inequality in part (a) (i).

Answer: (2)

(b) (i) Solve the inequality $5 - y > 8$

Answer: (2)

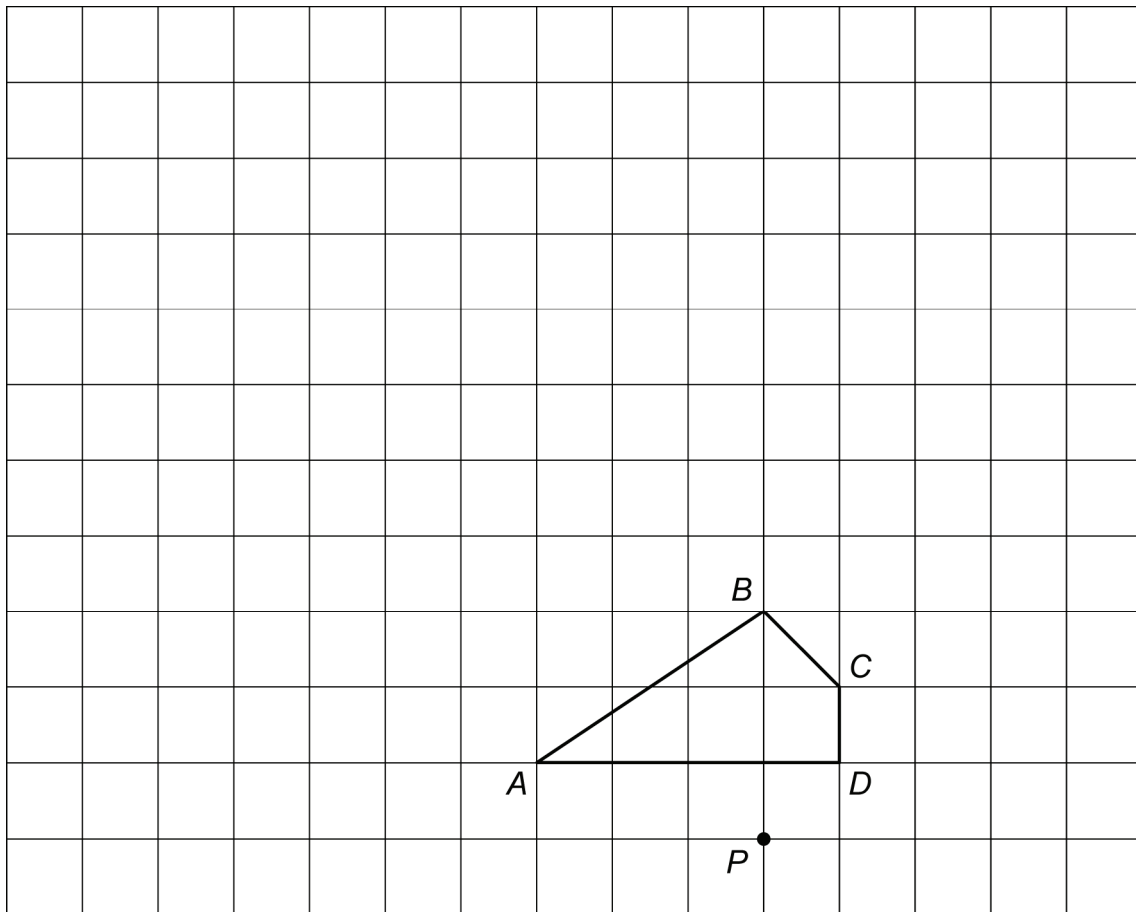
(ii) What is the largest value of y that satisfies the inequality in part (b) (i)?

Answer: $y =$ (1)

(c) Complete the table of values for the function $y = 2x^2 + 3x - 2$ (3)

x	-3	-2	-1	0	1	2	3
x^2	9	4	1	0	1	4	9
$2x^2$	18	8	2	0	2	8	18
$3x$	-9	-6		0			9
y	7	0		-2			25

8. (a) (i) On the grid below, with centre P , enlarge $ABCD$ by scale factor 3 and label the image $A'B'C'D'$ (3)



The area of $A'B'C'D'$ is $40\frac{1}{2}$ cm².

- (ii) What is the area of $ABCD$?

Answer: cm² (2)

Turn over to the next page for question 8 (b)

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(b) A regular polygon has an interior angle of 172.5° .

(i) Calculate the exterior angle of the polygon.

Answer: $^\circ$ (1)

(ii) How many sides has the polygon?

Answer: sides (2)

(iii) The length of a diagonal passing through the centre of the polygon is 14 cm.

Taking π to be $\frac{22}{7}$, calculate the approximate area of the polygon.

Answer: cm^2 (2)

9 (a) Jill runs 400 metres in 1 minute 20 seconds.

Find her average speed:

(i) in metres per second

Answer: m/s (1)

(ii) in kilometres per hour.

Answer: km/h (2)

(b) The mean mass of the 11 members of the school soccer team is 39 kg.

(i) What is the total mass of the team?

Answer: kg (1)

The team are about to get into an hotel lift when they see that the notice says '*maximum load 400 kg*'.

One of the team, whose mass is 34 kg, walks up the stairs instead of taking the lift.

(ii) What is the mean mass of the team members in the lift?

Answer: kg (2)

(c) Over five days, Jack's average speed for the 9 kilometre cycle journey to school is 12 km/h.

(i) What is his average time for the journey?

Answer: minutes (2)

The range of his times is 6 minutes, the median time is 46 minutes and the modal time is 47 minutes.

(ii) What is his second slowest time?

Answer: minutes (2)

10 (a) 11 pupils investigated the effect of heat on a sample of a mineral.

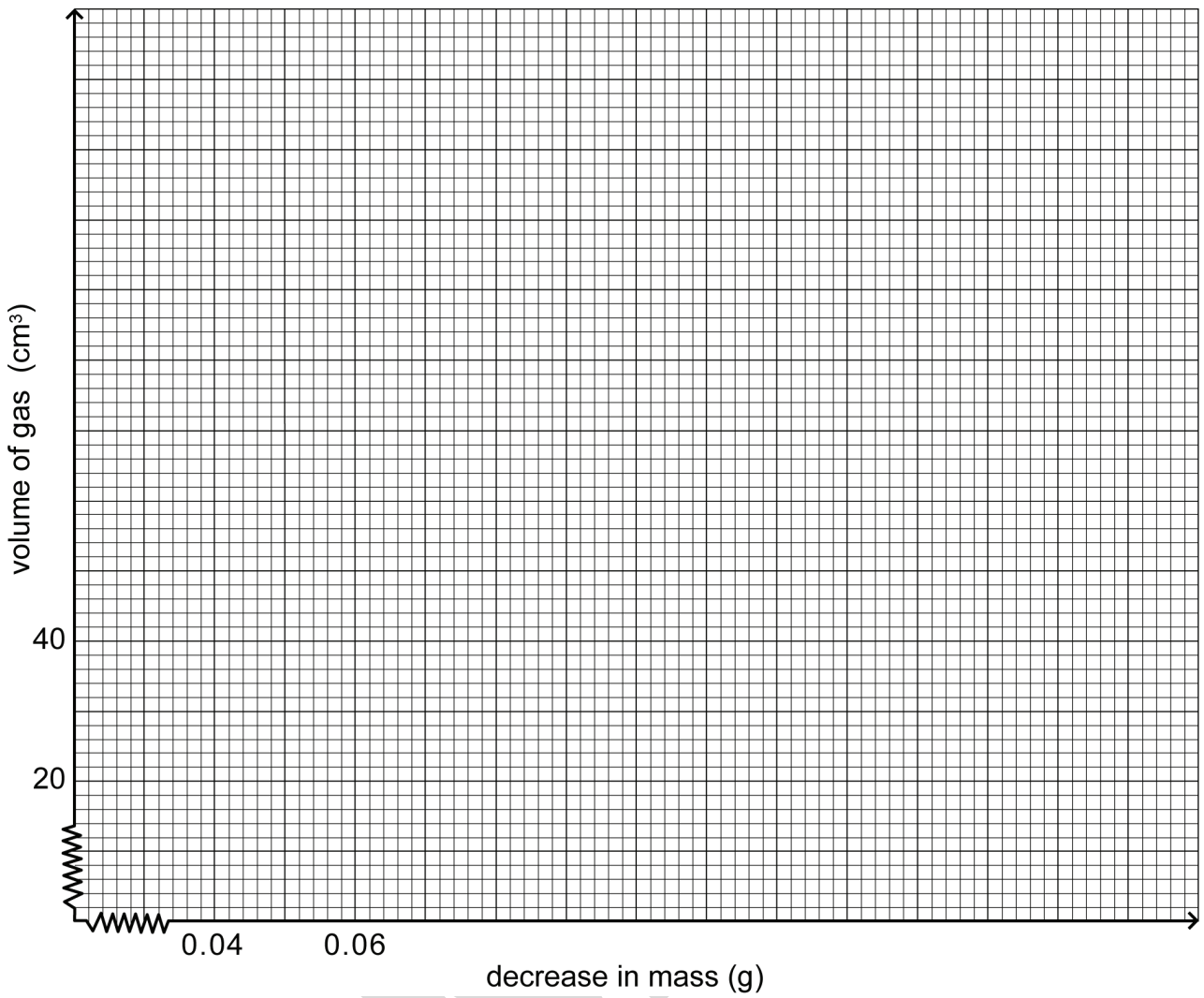
They recorded the decrease in mass and the volume of gas produced.

pupil	decrease in mass (g)	volume of gas (cm ³)
Anna	0.07	44
Brian	0.10	61
Clare	0.10	50
Dana	0.13	76
Ellie	0.07	41
Flora	0.08	50
Gina	0.16	80
Hal	0.07	48
Ian	0.15	75
Jane	0.09	56
Katie		66

Katie forgot to record her result for the decrease in mass.

- (i) Complete the scales on the axes opposite and plot the results of the first ten pupils.

(3)



(ii) On the scatter graph, draw by eye the line of best fit. (2)

(iii) From your graph, estimate the decrease in mass for Katie's sample.

Answer: g (1)

Turn over to the next page for question 10 (b)

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(b) In a raffle 360 tickets have been sold.

Gerry has bought one ticket.

(i) What is the probability that Gerry will win first prize in the raffle?

Answer: (1)

Polly has bought 20 tickets.

(ii) What is the probability that Polly does **not** win first prize in the raffle?

Answer: (2)

The first ticket is drawn and Gerry wins first prize.

His ticket is removed and a new ticket is drawn for second prize.

(iii) What is the probability that the second prize will be won by Polly?

Answer: (1)

ISEB Assessments

Year 8 Level 3 Maths Test 3

Answers

Author: ISEB



This document consists of a full set of answers to the questions in Year 8 Level 3 Maths Test 3.

Total marks: 100

These answers are part of *Year 8 Level 3 Maths Test 3.zip*, which also contains:

Year 8 Level 3 Maths Test 3.pdf

(the test)

Year 8 Level 3 Maths Test 3 Teacher's Document.pdf

(the teacher's document)

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Year 8 Level 3 Maths Test 3 Answers

1. (a) 0.95 (2)
(b) 16.8 (2)
(c) $\frac{11}{24}$ (2)
(d) $3\frac{13}{20}$ (4)
2. (a) (i) £1500 (2)
(ii) 140% (2)
(iii) 200% (2)
(b) (i) 8 sweets (1)
(ii) 9 sweets (2)
(iii) Mike 12, Emma 16, left over 2 (1)
3. (i) $w = (2x + 3)$ cm (2)
(ii) $10x$ cm² (1)
(iii) 18 cm² (2)
(iv) $(20x + 18)$ cm² (2)
(v) (a) $x = 1\frac{1}{2}$ (2)
(b) 6 cm (1)
4. (i) (a) $c + t = 150$ (1)
(b) $7c + 6t = 970$ (2)
(ii) $c = 70, t = 80$ (4)
(iii) (a) £48 (1)
(b) £49 (1)
(iv) 7 : 8 (1)

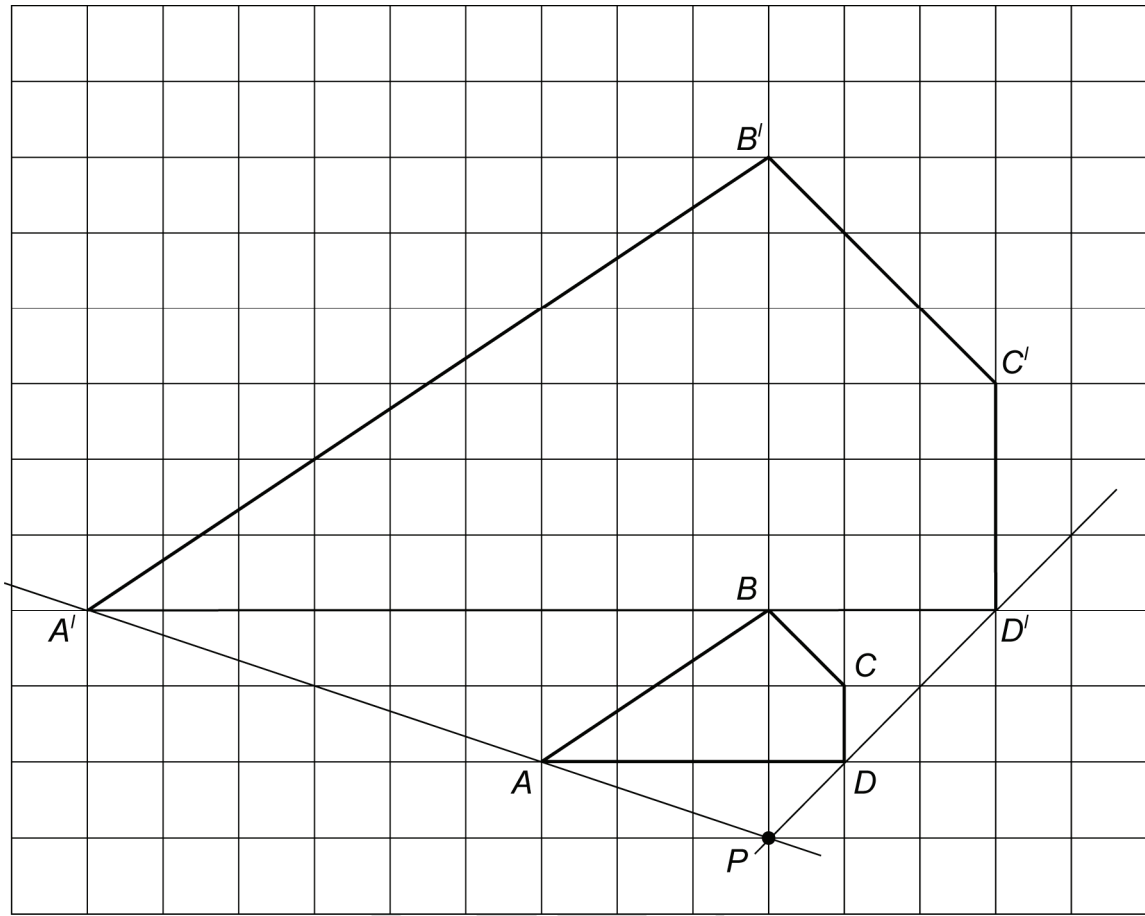
5. (a) (i) $4ab$ (1)
 (ii) $\frac{3c}{2}$ (2)
 (iii) $3d + 5$ (2)
- (b) (i) 35, 43 (1)
 (ii) 155 (2)
 (iii) $8n - 5$ (2)

6. (a) (i) $x = 7\frac{1}{2}$ (2)
 (ii) $y = 13$ (2)
 (iii) $z = -7\frac{1}{2}$ (2)
- (b) (i) 5 (1)
 (ii) 0 (1)
 (iii) 9 (1)
 (iv) -4 (1)

7. (a) (i) $x \leq 5$ (2)
 (ii) 3, 4, 5 (2)
- (b) (i) $y < -3$ (2)
 (ii) $y = -4$ (1)
- (c) Completed table (3)

x	-3	-2	-1	0	1	2	3
x²	9	4	1	0	1	4	9
2x²	18	8	2	0	2	8	18
3x	-9	-6	-3	0	3	6	9
y	7	0	-3	-2	3	12	25

8. (a) (i) Enlargement $A'B'C'D'$ drawn (3)



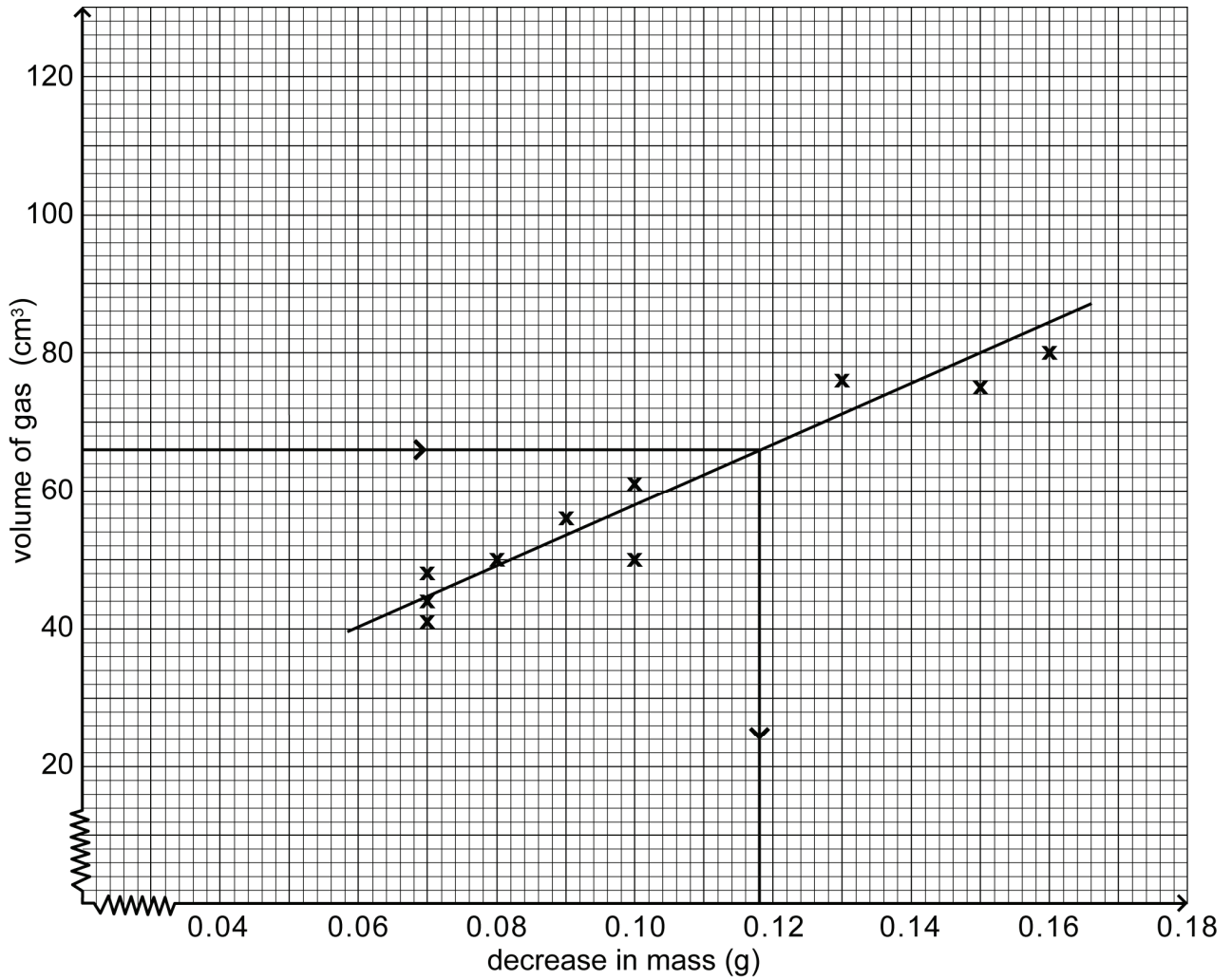
- (ii) $4\frac{1}{2} \text{ cm}^2$ (2)

- (b) (i) 7.5° (1)
 (ii) 48 sides (2)
 (iii) 154 cm^2 (2)

9. (a) (i) 5 m/s (1)
 (ii) 18 km/h (2)
- (b) (i) 45 minutes (2)
 (ii) 44 minutes (2)
- (c) (i) 429 kg (1)
 (ii) 39.5 kg (2)

10. (a) (i) Points plotted

(4)



(ii) Line of best fit drawn

(1)

(iii) Approximately 0.12 g

(1)

(b) (i) $\frac{1}{360}$

(1)

(ii) $\frac{17}{18}$

(2)

(iii) $\frac{20}{359}$

(1)

ISEB Assessments

Year 8 Level 3 Maths Test 3

Teacher's Document



This test contains a selected set of 10 questions aimed at Year 8 pupils. The questions are arranged in a particular topic order, with calculation covered throughout, as follows:

Topic	Question
Number	1
	2
Problems	3
	4
Algebra	5
	6
	7
Shape, Space and Measures	8
Handling Data	9
	10

Total marks: 100

Total time allocated: 1 hour

Calculators are not allowed.

Teachers should feel free to use this resource in whatever way is most appropriate for their scheme of work. The test can be attempted all at once and is designed to take a Year 8 pupil approximately one hour to complete.

Some questions require pupils to explain their answers. If you feel that this is too demanding, pupils can be instructed to explain themselves orally to you or to the rest of the class in a discussion.

Please refer to the printing instructions provided on the next page of this teacher's document before printing copies of the test or the accompanying answers.

This teacher's document is part of *Year 8 Level 3 Maths Test 3.zip*, which also contains:

Year 8 Level 3 Maths Test 3.pdf

(the test)

Year 8 Level 3 Maths Test 3.Answers.pdf

(the answers)

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