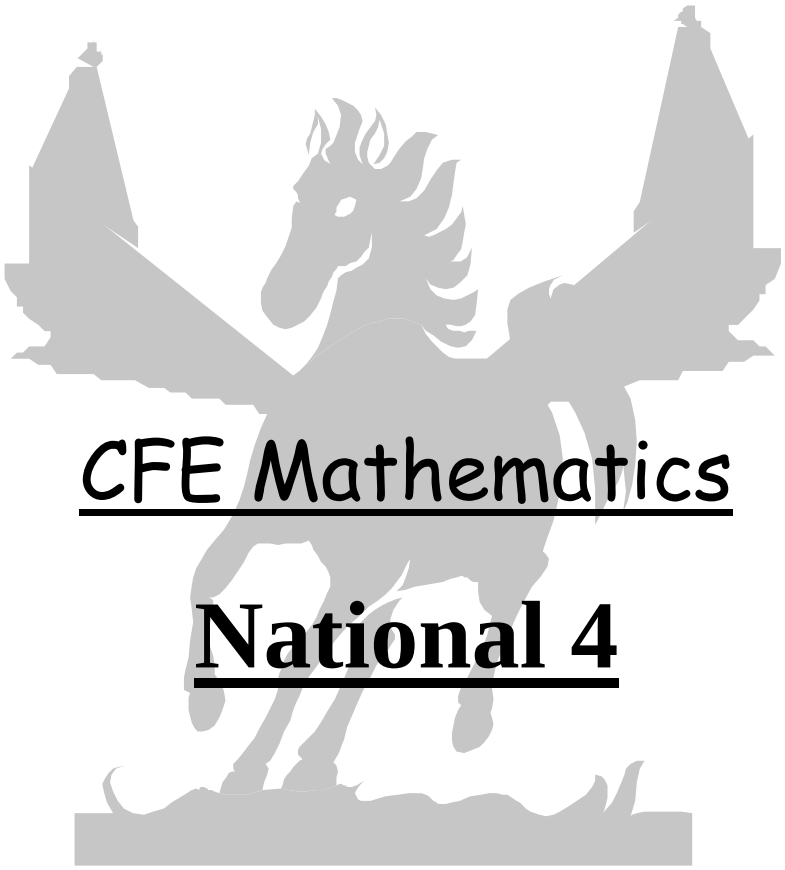
MATHEMATICS

Curriculum for Excellence - National 4 resources from Pegasys



CFE Mathematics

National 4

Practice Unit Tests

Contents & Information

- **9 Practice Unit Tests..... (3 for each unit)**
- **Answers & marking schemes**

Pegasys Educational Publishing

Practice Unit Assessment (1) for National 4 Expressions and Formulae

1. **(a)** Expand the brackets:

$$5(2m - 7)$$

(b) Expand the brackets and simplify:

$$2(4k + 3) + 2k.$$

2. Factorise $4x + 32$.

3. Simplify $3m + 5n + 6m - 2n$.

4. **(a)** When $x = 2$ and $y = 3$, find the value of $5x - 3y$.

(b) Norrie is a plumber.

He calculates the cost of a job using the formula:

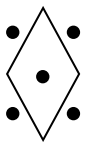
$$C = 26 \cdot 5H + 1 \cdot 5M$$

where C is the cost (in pounds), H is the number of hours he works, and M is the number of miles he travels to the job.

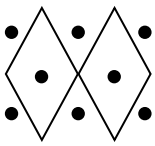
On one job he worked for 7 hours and travelled 32 miles.

Calculate how much Norrie charged for this particular job.

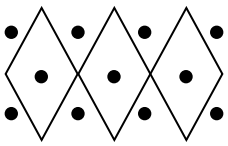
5. Milly bought a new top which has some coloured glass diamonds and beads round the neck. Here is how the pattern is built up.



Pattern 1
1 Diamond



Pattern 2
2 Diamonds



Pattern 3
3 Diamonds

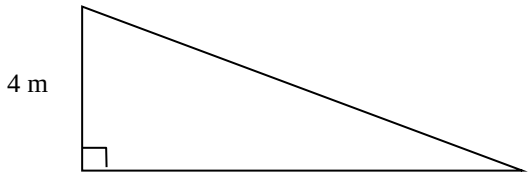
(a) Copy and complete the table for the number of diamonds (D) and number of beads (B) in other patterns.

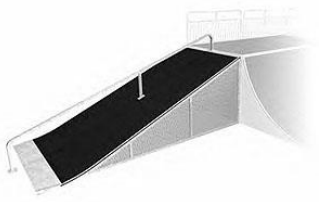
Number of Diamonds (D)	1	2	3	4	5		10
Number of Beads (B)	5	8					

(b) Write down a formula for calculating the number of beads (B) needed for any number of diamonds (D).

(c) A pattern has 50 beads. How many diamonds does it have?
You must show your working.

6. A skateboard ramp has been designed to have the following dimensions.





The ramp can only be used in competitions if the gradient of the slope is greater than 0·3.

(a) Calculate the gradient of the slope.

(b) Can this ramp be used in a competition? Give a reason for your answer.

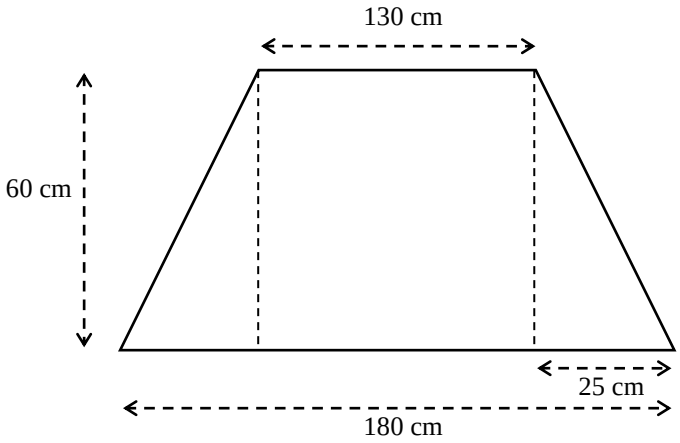
7. The speed limit outside schools is 20 miles per hour. The warning sign for this is shown below. The diameter of the sign is 30 cm.

(a) Calculate the circumference of the sign.

(b) Calculate the area of the sign.

8. A car windscreen is formed from a 'curved' trapezium.

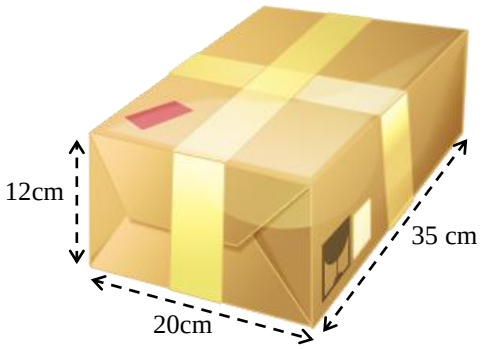
The trapezium is made up of a rectangle and two identical right-angled triangles, as shown in the diagram below.



Find the area of the windscreen.

9. A parcel is in the shape of a cuboid.

It is 35 centimetres long, 20 centimetres wide and 12 centimetres high, as shown below.

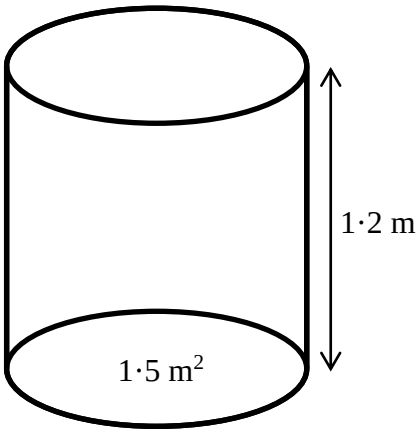


Find the surface area of the cuboid shown.

10. I have a large container in my garden for collecting water.

The area of the base of the container is 1·5 square metres.

The height of the container is 1·2 metres.

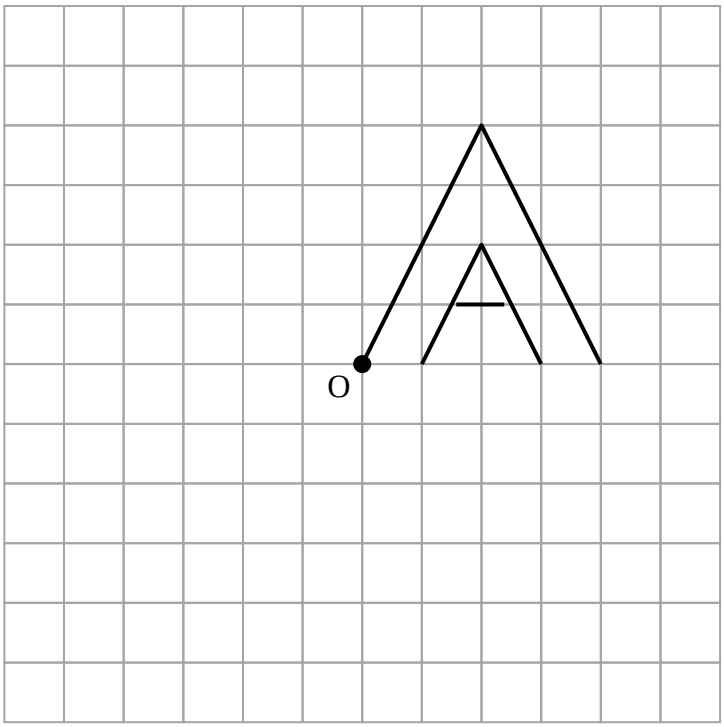


Calculate the volume of the container.

11. Andy's Autos have designed a new logo for their company.

Part of the design for the logo is shown below.

Complete this shape so that it has rotational symmetry of order 4, about 0.



12. The number of visitors to an exhibition was recorded each day for two weeks.

The results are shown below.

77	93	87	71	90	98	100
78	84	91	97	88	102	107

Copy and complete the frequency table for these results.

Score	**Tally**	**Frequency**
70 – 79		
		Total =

13. Ten people were asked how long they had waited in a queue to get into an exhibition.
The time, in minutes, was recorded and the results are shown below.

14	23	21	15	12
22	26	22	17	16

(a) Calculate the mean time taken.

(b) Calculate the range.

The manager thought that these times were too long and introduced measures to cut the waiting times.
After this happened the mean waiting time was 15 minutes and the range 10.

(c) Write two comments comparing the results before and after these were introduced.

14. A group of sixty students were asked what there favourite 'soap' was.
The table below shows the results.

Soap	No. of students
Eastenders	15
Emmerdale	20
Corrie	25

Construct a pie chart to show this information.
To help you complete the pie chart, copy this table and fill in the blanks.

Soap	No. of pupils	Angle at centre
Eastenders	15	
Emmerdale	20	
Corrie	25	

Now complete the pie chart.

15. An octahedral die has eight faces numbered one to eight.

When it is thrown it comes to rest on one of its faces.

What is the probability that it comes to rest on a number greater than 3?

End of Question Paper

Practice Unit Assessment (1) for Expressions and Formulae: Marking Scheme

Points of reasoning are marked # in the table.

Question	Main Points of expected responses	
1(a)	●^{1} multiply out brackets	●^{1} $10m - 35$
(b)	●^{2} multiply out brackets	●^{2} $8k + 6 + 2k$
	●^{3} collect like terms	●^{3} $10k + 6$
2	●^{1} identify common factor	●^{1} 4
	●^{2} factorise expression	●^{2} $4(x + 8)$
3	●^{1} collect like terms	●^{1} $9m + 3n$
4(a)	●^{1} substitute into expression	●^{1} $5 \times 2 - 3 \times 3$
	●^{2} evaluate expression	●^{2} 1
(b)	●^{3} substitute into expression	●^{3} $26{\cdot}5 \times 7 + 1{\cdot}5 \times 32$
	●^{4} evaluate expression	●^{4} £233.50
5(a)	●^{1} extend sequence	●^{1} 11, 14, 17
	●^{2} complete table	●^{2} 32
(b)	●^{3} begin to find formula	●^{3} $\times 3$
	●^{4} correct formula	●^{4} $B = 3D + 2$
(c)	#2.1 valid strategy	#2.1 $50 = 3D + 2$
	●^{5} correct solution	●^{5} 16
6(a)	●^{1} calculate gradient	●^{1} $\frac{4}{15} = 0{\cdot}2666\ldots\ldots$
(b)	#2.2 correct conclusion with reason	#2.2 no as $0{\cdot}2666 < 3$
7(a)	●^{1} circumference of circle	●^{1} $\pi \times 30$
	●^{2} calculate circumference	●^{2} 94·2 cm
(b)	●^{3} area of circle	●^{3} $\pi \times 15^2$
	●^{4} calculate area of circle	●^{4} $706{\cdot}5\text{cm}^2$
8	●^{1} areas of rectangle and triangle	●^{1} $130 \times 60 = 7800$
	●^{2} area of trapezium	$\frac{1}{2} \times 25 \times 60 = 750$
		●^{2} 9330 cm²
9	●^{1} calculate all 3 areas	●^{1} 240, 700, 420
	●^{2} find total area	●^{2} 2720 cm²
10	●^{1} volume of cylinder	●^{1} $1{\cdot}5 \times 1{\cdot}2$
	●^{2} correct answer	●^{2} 1·8 m³

11	#2.1 correct strategy	#2.1 three further shapes drawn at least two of which are correct
12	●[1] correct intervals and tally marks ●[2] all frequencies correct	●[1] 70 – 79 (3), 80 – 89 (3), 90 – 99 (5), 100 – 109 (3) ●[2] 3, 3, 5, 3
13	●[1] calculate total time ●[2] calculate mean ●[3] find range #2.1 compare mean compare range	●[1] 188 minutes ●[2] 18·8 minutes ●[3] 14 #2.1 on average the waiting time was reduced after measures The difference between the longest and shortest time was less after measures
14	●[1] calculates angles in a pie chart ●[2] construct pie chart ●[3] label sections	●[1] 90°, 120°, 150° ●[2] pie chart drawn correct angles correct to±2 degrees ●[3] appropriate labels
15	●[1] state probability	●[1] $\frac{5}{8}$

Practice Unit Assessment (2) for National 4 Expressions and Formulae

1. **(a)** Expand the brackets:

$$4(2 - 3h)$$

(b) Expand the brackets and simplify:

$$5(3b + 1) + 7b.$$

2. Factorise $6x - 54$.

3. Simplify $6a + 3b + b - 2a$.

4. **(a)** When $c = 4$ and $d = 7$, find the value of $2c + 3d$.

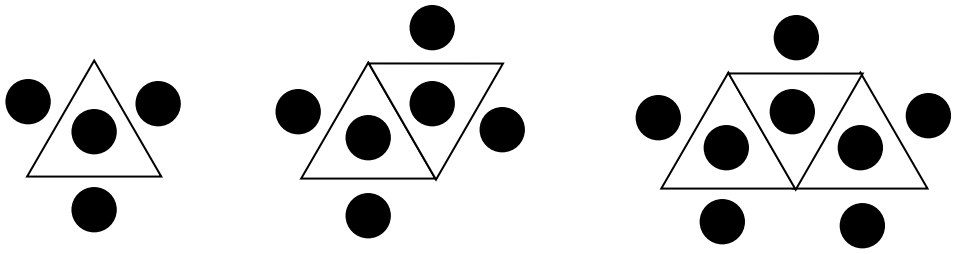
(b) The Pronto Parcels delivery company uses this formula to calculate the cost of delivering parcels.

$$C = 6{\cdot}5P + 0{\cdot}75M$$

where C is the cost (in pounds), P is the number of parcels delivered, and D is the number of miles travelled to make the delivery.

Calculate the cost of delivering 7 parcels to an address 140 miles away.

3. Carol is making a pattern with triangles and circles.
Here is how the pattern is built up.



Pattern 1
1 Triangle

Pattern 2
2 Triangles

Pattern 3
3 Triangles

(a) Complete the table for the number of triangles and number of circles in other patterns.

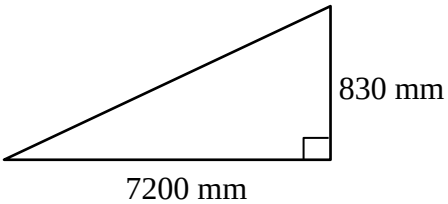
Number of Triangles (*T*)	1	2	3	4	5	6		10
Number of Circles (*C*)	4	6	8					

(b) Write down a rule for finding the number of circles (*C*) needed for any number of triangles (*T*).

(c) Another pattern has a total of 56 circles. How many triangles were there?

6. The manufacturer of a ramp for a shop entrance states that to be suitable for a wheelchair user the gradient of the ramp must lie between 0·1 and 0·15.

(a) Calculate the gradient of the slope.



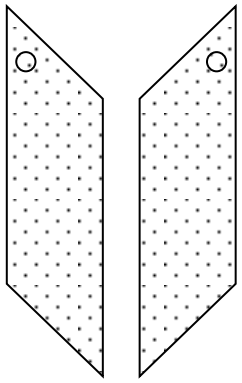
(b) Is this ramp suitable for wheelchair users?

7. Polly's Pizza Parlour sells pizzas with diameter 26cm.

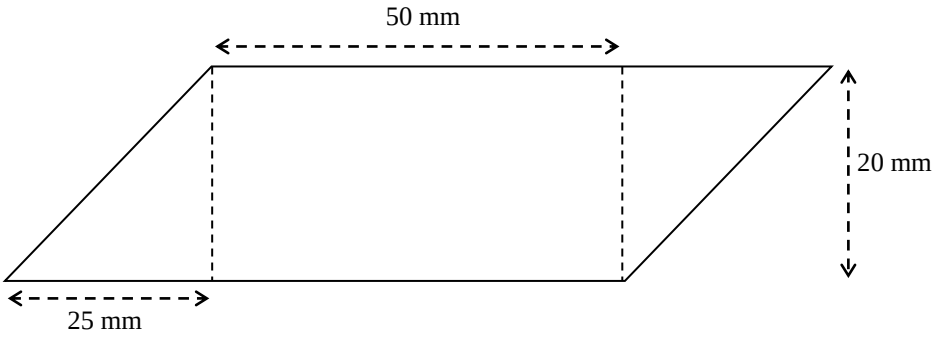
(a) Calculate the circumference of the pizza.

(b) Calculate the area of the area of the pizza.

8. Earrings are shaped like a parallelogram.



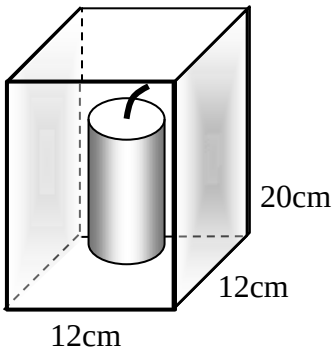
Each earring is made up of a rectangle and two identical right-angled triangles, as shown in the diagram below.



Find the area of one of the earrings.

9. As a safety measure, a candle is displayed in a glass case in the shape of a cuboid which is **open at the top.**

The base measures 12cm by 12cm and its height is 20cm.

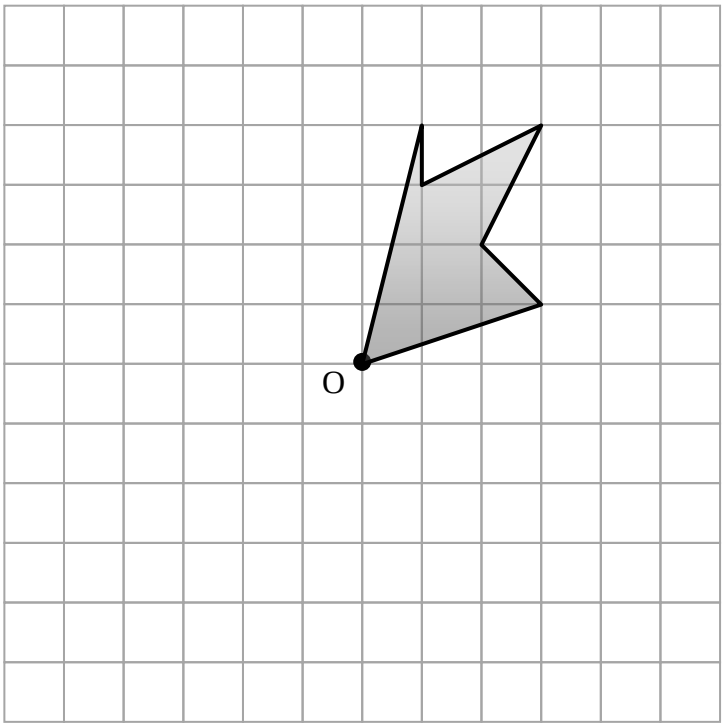


Calculate the amount of glass that would be need to used to make this case.

10. A heart – shaped chocolate box has a base area of 250 cm².
The depth of the box is 4·5 centimetres.

Calculate the volume of the chocolate box.

11. A textile company is designing a new cushion pattern which has rotational symmetry.
Part of the design is shown below.
Complete this shape so that it has rotational symmetry of order 4, about 0.



12. The marks obtained (out of 30) in a test by a group of students are given in this list.

26	23	17	29	2	19	20
27	24	21	30	18	22	17

Copy and complete the frequency table for these results.

Score	**Tally**	**Frequency**
1 – 6		
		Total =

13. Eight people were weighed at a slimming class before embarking on a healthy eating campaign. Their weights, in kilograms, are shown below.

84	75	61	65
72	86	64	77

(a) Calculate the mean weight.

(b) Calculate the range.

After two months on the healthy eating campaign they were weighed again and this time the mean was 70 kg with a range of 20. .

(c) Write two comments comparing the results before and after the healthy eating campaign.

14. One hundred and twenty people were asked in which season their birthday fell.
The table below shows the results:

Season	**No. of students**
Spring	30
Summer	35
Autumn	45
Winter	10

Construct a pie chart to show this information.

To help you complete the pie chart, copy this table and fill in the blanks.

Season	**No. of pupils**	**Angle at centre**
Spring	30	
Summer	35	
Autumn	45	
Winter	10	

Now complete the pie chart.

15. As people left a travel agent they were asked what kind of holiday they had booked. Here is what they said:

Package Holidays:	24
Cruise:	13
Camping:	6
Activity:	7

What is the probability that someone chosen at random will have booked a cruise?

End of Question Paper

Practice Unit Assessment (2) for Expressions and Formulae: Marking Scheme

Points of reasoning are marked # in the table.

Question	Main Points of expected responses	
1(a)	●[1] multiply out brackets	●[1] $8 - 12h$
(b)	●[2] multiply out brackets	●[2] $15b + 5 + 7b$
	●[3] collect like terms	●[3] $22b + 5$
2	●[1] identify common factor	●[1] 6
	●[2] factorise expression	●[2] $6(x - 9)$
3	●[1] collect like terms	●[1] $4a + 4b$
4(a)	●[1] substitute into expression	●[1] $2 \times 4 + 3 \times 7$
	●[2] evaluate expression	●[2] 29
(b)	●[3] substitute into expression	●[3] $6{\cdot}5 \times 7 + 0{\cdot}75 \times 140$
	●[4] evaluate expression	●[4] £150.50
5(a)	●[1] extend sequence	●[1] 10, 12, 14
	●[2] complete table	●[2] 22
(b)	●[3] begin to find formula	●[3] $\times 2$
	●[4] correct formula	●[4] $C = 2T + 2$
(c)	#2.1 valid strategy	#2.1 $56 = 2D + 2$
	●[5] correct solution	●[5] 27
6(a)	●[1] calculate gradient	●[1] $\frac{830}{7200} = 0{\cdot}11527\ldots\ldots$
(b)	#2.2 correct conclusion with reason	#2.2 yes since $0{\cdot}1 < 0{\cdot}12 < 0{\cdot}15$
7(a)	●[1] circumference of circle	●[1] $\pi \times 26$
	●[2] calculate circumference	●[2] 81·64 cm
(b)	●[3] area of circle	●[3] $\pi \times 13^2$
	●[4] calculate area of circle	●[4] 530·66 cm²
8	●[1] areas of rectangle and triangle	●[1] $50 \times 20 = 1000$
	●[2] area of parallelogram	$\frac{1}{2} \times 25 \times 20 = 250$
		●[2] 1500 cm²
9	●[1] calculate both areas	●[1] 144, 240
	●[2] find total area	●[2] 1104 cm²

10	●[1] volume of box ●[2] correct answer	●[1] $250 \times 4{\cdot}5$ ●[2] 1125 cm^3
11	#2.1 correct strategy	#2.1 three further shapes drawn at least two of which are correct
12	●[1] correct intervals and tally marks ●[2] all frequencies correct	●[1] 1 – 6 (1), 7 – 12 (0), 13 – 18 (3), 19 – 24 (6), 25 – 30 (4) ●[2] 1, 0, 3, 6, 4
13	●[1] calculate total weight ●[2] calculate mean ●[3] find range #2.1 compare mean compare range	●[1] 584 kilograms ●[2] 73 kilograms ●[3] 25 #2.1 on average the weight was reduced after healthy eating The difference between the longest and shortest time was less after healthy eating
14	●[1] calculates angles in a pie chart ●[2] construct pie chart ●[3] label sections	●[1] 90º, 105º, 135º, 30º ●[2] pie chart drawn correct angles correct to±2 degrees ●[3] appropriate labels
15	●[1] state probability	●[1] $\frac{13}{50}$

Practice Unit Assessment (3) for National 4 Expressions and Formulae

1. **(a)** Expand the brackets: $2(5 - 4x)$

(b) Expand the brackets and simplify:

$$3d + 4(7 + 2d)$$

2. Factorise $72 - 6x$

3. Simplify $5g + 4h - 2h - g$.

4. **(a)** When $m = 5$ and $n = 7$, find the value of $4n - 3m$.

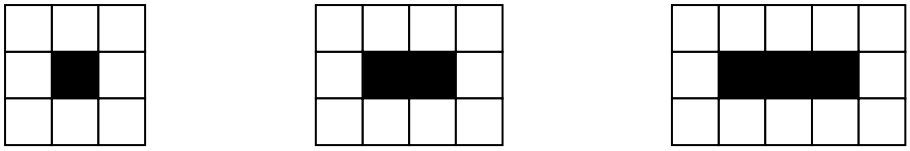
(b) A publishing company sends out flyers to customers to advertise its services.
The cost to the company of doing this is calculated using this formula:

$$C = 9{\cdot}15H + 0{\cdot}5S$$

where C is the cost (in pounds), H is the number of hours someone is paid to prepare the flyers , and S is the number of stamps bought to post them.

Calculate the cost when it took Stewart 5 hours to prepare the flyers and 420 stamps were used.

3. A pattern of black and white tiles is made up as shown in these diagrams.



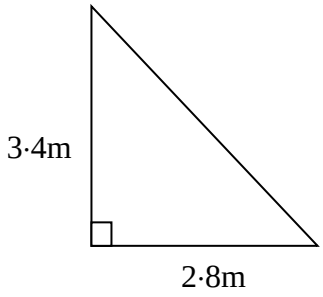
(a) Complete the table for the number of black tiles and number of white tiles in other patterns.

Number of black tiles (*B*)	1	2	3	4	5	6		10
Number of white tiles (*W*)	8	10	12					

(b) Write down a rule for finding the number of white tiles (*W*) needed for any number of black tiles (*B*).

(c) Another pattern has a total of 46 white tiles. How many black tiles were there?

6. I have just had a new staircase fitted in my house. It has a height of 2·9m and is 3·9m horizontally.

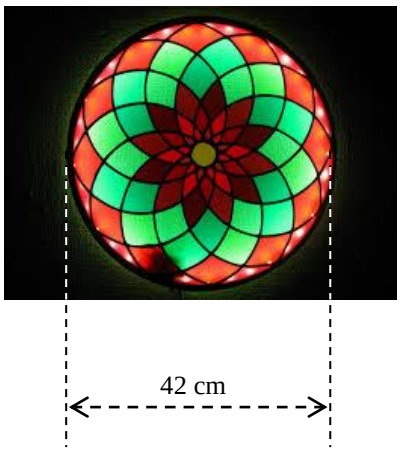


To be safe the gradient of the stairs has to be between 1·2 and 1·3.

(a) Calculate the gradient of the stairs.

(b) Is this staircase safe?

7. A decorative plaque in a church window is circular and has a diameter of 42cm.

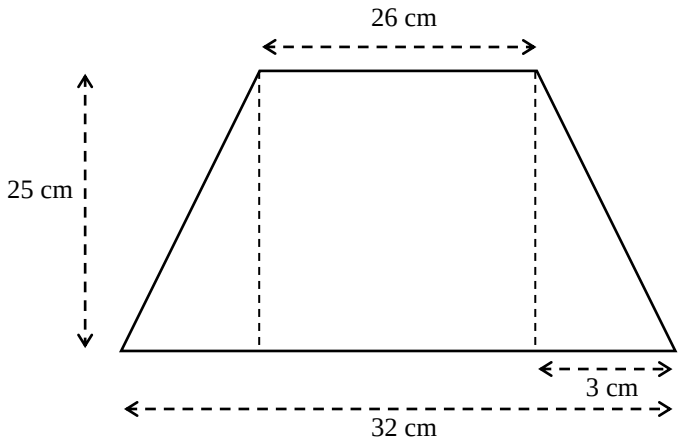


(a) Calculate the circumference of the plaque.

(b) Calculate the area of the area of the plaque.

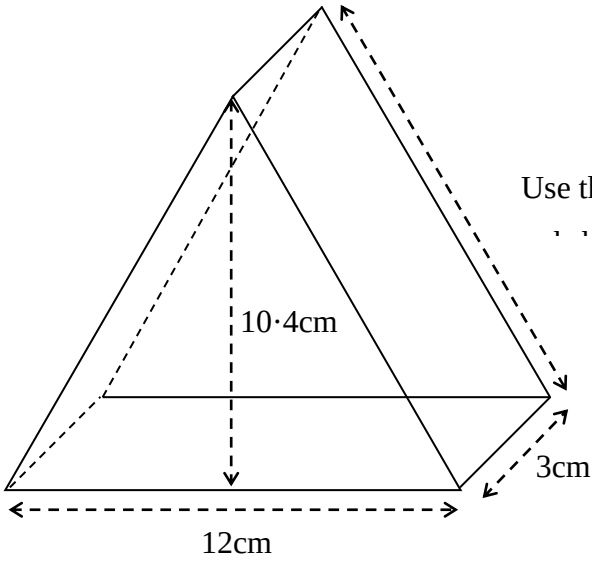
8. The front of a handbag is shaped like a trapezium.

The trapezium is made up of a rectangle and two identical right-angled triangles, as shown in the diagram below.



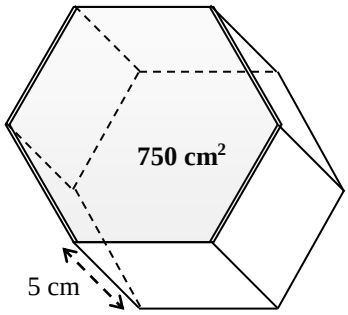
Find the area of the handbag.

9. A box is in the shape of a triangular prism with dimensions as shown in the diagram.



Calculate the surface area of the triangular prism.

10. A box of toiletries is a prism as shown in the diagram.
The area of the base is 750cm² and has height 5cm.

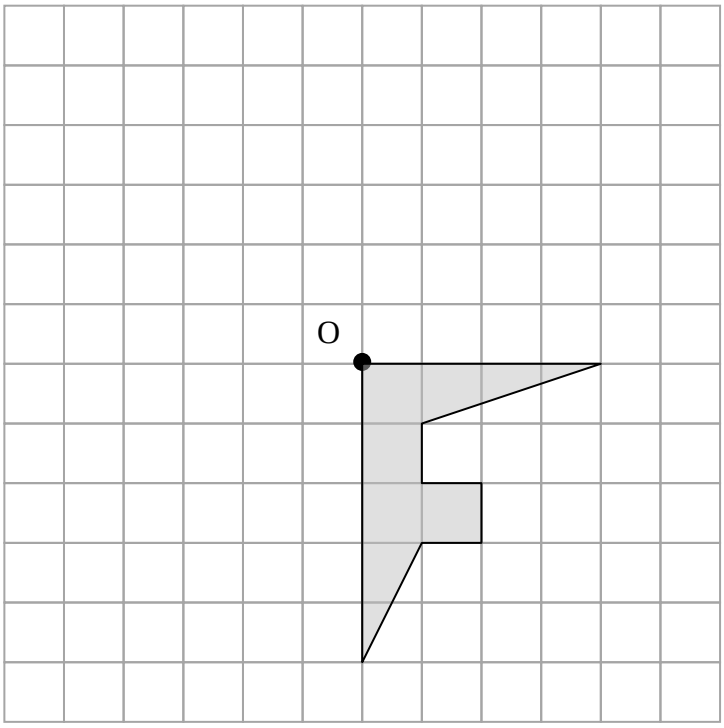


Calculate the volume of the box.

11. A company is designing a new logo.

Part of the design is shown below.

Complete this shape so that it has rotational symmetry of order 4, about 0.



12. The number of people attending an emergency dental clinic over the course of three weeks was recorded. Here are the results

13	12	5	19	15	10	12	22
18	13	12	21	9	11	16	

Copy and complete the frequency table for these results.

Score	**Tally**	**Frequency**
1 – 5		
		Total =

13. The tips received by a group of 8 waiters in a restaurant one Saturday evening are shown here.

£12	£24	£17	£22
£19	£20	£23	£15

(a) Calculate the mean weight.

(b) Calculate the range.

The waiters went on a customer services course during the following week.
The next Saturday evening their tips gave a mean of £25 with a range of £9.

(c) Write two comments comparing the results before and after the course.

14. One hundred and sixty people were asked to say what sports they played.
. The table below shows the results.

Sport	**No. of students**
Indoor	40
Outdoor	72
Don't play sport	48

Construct a pie chart to show this information.
To help you complete the pie chart, copy this table and fill in the blanks.

Sport	**No. of pupils**	**Angle at centre**
Indoor	40	
Outdoor	72	
Don't play sport	48	

Now complete the pie chart.

15. A card is chosen from this set of cards.

What is the probability that it will **not** be a face card?

End of Question Paper

Practice Unit Assessment (3) for Expressions and Formulae: Marking Scheme

Points of reasoning are marked # in the table.

Question	Main Points of expected responses	
1(a)	●^{1} multiply out brackets	●^{1} $10 - 8x$
(b)	●^{2} multiply out brackets	●^{2} $3d + 28 + 8d$
	●^{3} collect like terms	●^{3} $11d + 28$
2	●^{1} identify common factor	●^{1} 6
	●^{2} factorise expression	●^{2} $6(12 - x)$
3	●^{1} collect like terms	●^{1} $4g + 2h$
4(a)	●^{1} substitute into expression	●^{1} $4 \times 7 - 3 \times 5$
	●^{2} evaluate expression	●^{2} 13
(b)	●^{3} substitute into expression	●^{3} $9{\cdot}15 \times 5 + 0{\cdot}5 \times 420$
	●^{4} evaluate expression	●^{4} £255.75
5(a)	●^{1} extend sequence	●^{1} 14, 16, 18
	●^{2} complete table	●^{2} 26
(b)	●^{3} begin to find formula	●^{3} $\times 2$
	●^{4} correct formula	●^{4} $W = 2B + 6$
(c)	#2.1 valid strategy	#2.1 $46 = 2B + 6$
	●^{5} correct solution	●^{5} 20
6(a)	●^{1} calculate gradient	●^{1} $\frac{3 \cdot 4}{2 \cdot 8} = 1 \cdot 214.....$
(b)	#2.2 correct conclusion with reason	#2.2 yes since $0{\cdot}1 < 0{\cdot}12 < 0{\cdot}15$
7(a)	●^{1} circumference of circle	●^{1} $\pi \times 42$
	●^{2} calculate circumference	●^{2} 132 cm
(b)	●^{3} area of circle	●^{3} $\pi \times 21^2$
	●^{4} calculate area of circle	●^{4} 1385 cm²
8	●^{1} areas of rectangle and triangle	●^{1} $26 \times 25 = 650$
	●^{2} area of trapezium	$\frac{1}{2} \times 25 \times 3 = 37{\cdot}5$
		●^{2} 725 cm²
9	●^{1} calculate both areas	●^{1} 62·4, 36
	●^{2} find total area	●^{2} 232·8 cm²

10	●[1] volume of box ●[2] correct answer	●[1] 750×5 ●[2] $3750\ cm^3$
11	#2.1 correct strategy	#2.1 three further shapes drawn at least two of which are correct
12	●[1] correct intervals and tally marks ●[2] all frequencies correct	●[1] 1 – 5 (1), 6 – 10 (2), 11 – 15 (7), 16 – 20 (3), 21 – 25 (2) ●[2] 1, 2, 7, 3, 2
13	●[1] calculate total weight ●[2] calculate mean ●[3] find range #2.1 compare mean compare range	●[1] £152 ●[2] £19 ●[3] £12 #2.1 On average the tips went up. The difference between the highest and smallest tip was less after the course.
14	●[1] calculates angles in a pie chart ●[2] construct pie chart ●[3] label sections	●[1] 90^o, 162^o, 108^o ●[2] pie chart drawn correct angles correct to±2 degrees ●[3] appropriate labels
15	●[1] state probability	●[1] $\frac{2}{5}$

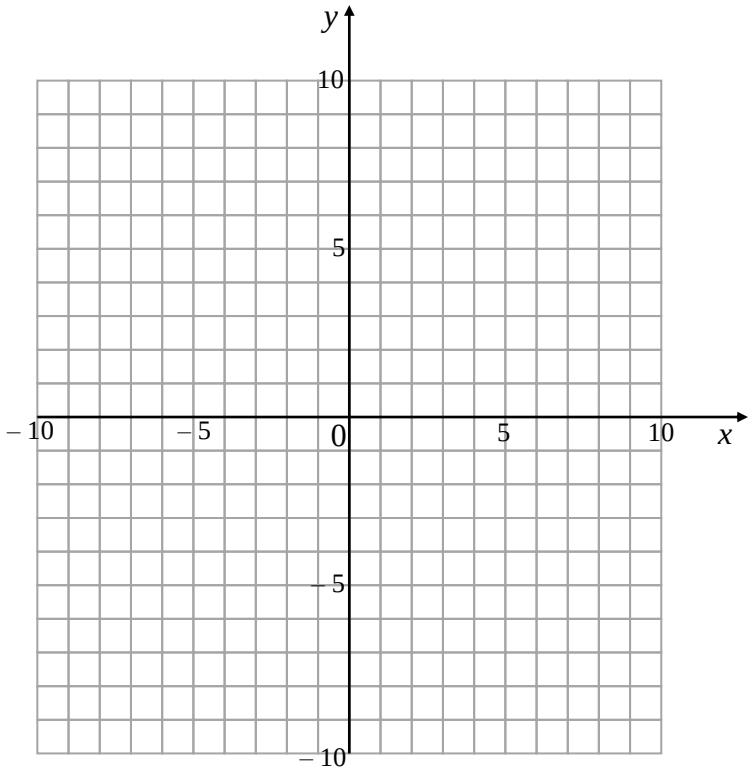
Practice Unit Assessment (1) for National 4 Relationships

Use the worksheet for Questions 1, 7 and 13

1. **(a)** Complete the table below for $y = 2x + 1$.

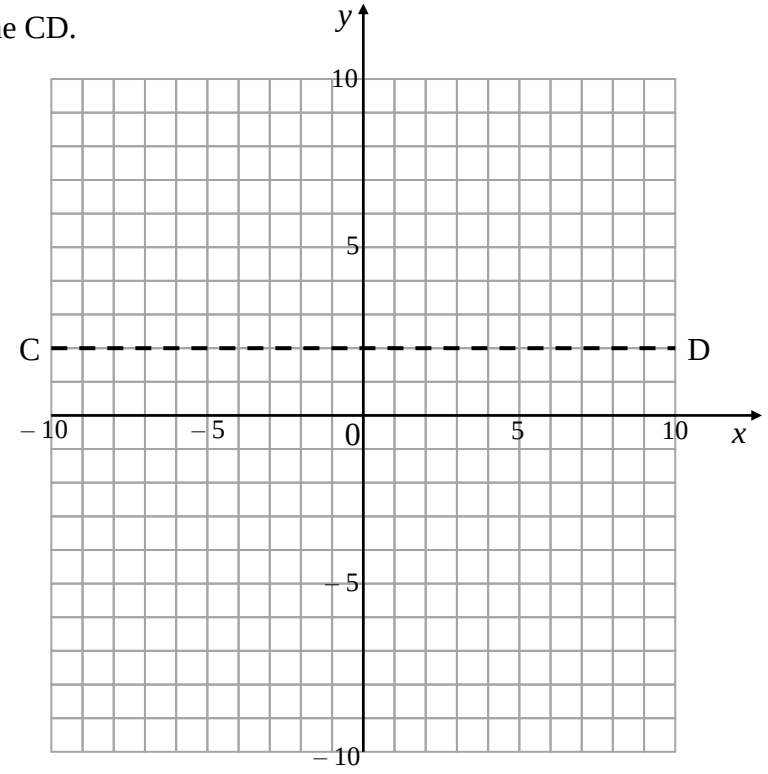
x	1	2	3
y			

(b) Draw the line $y = 2x + 1$.



2. Line CD is shown on the grid below.

Write down the equation of line CD.



3. Solve the following equation:

$$3y + 7 = -14$$

4. To find the distance of a journey we use the formula $D = ST$

Change the subject of the formula to T.

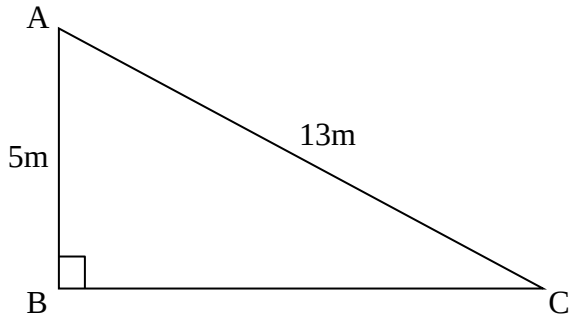
5. Change the subject of the formula

$a = 7b + 2$ to b.

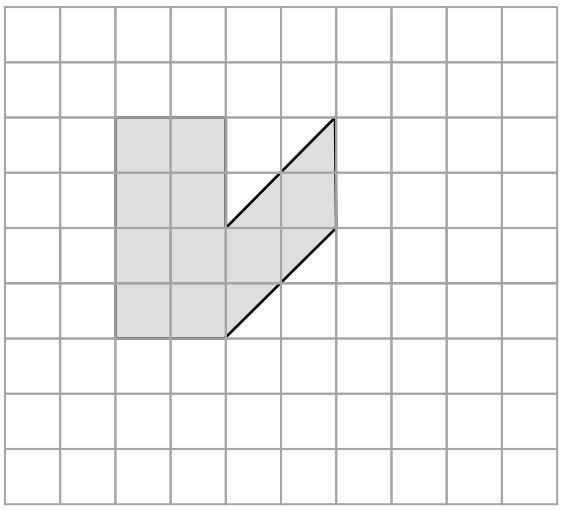
6. Triangle ABC is a right-angled triangle as shown in the diagram below.

AB is 5 metres long and AC is 13 metres long.

Calculate the length of AC (in metres).



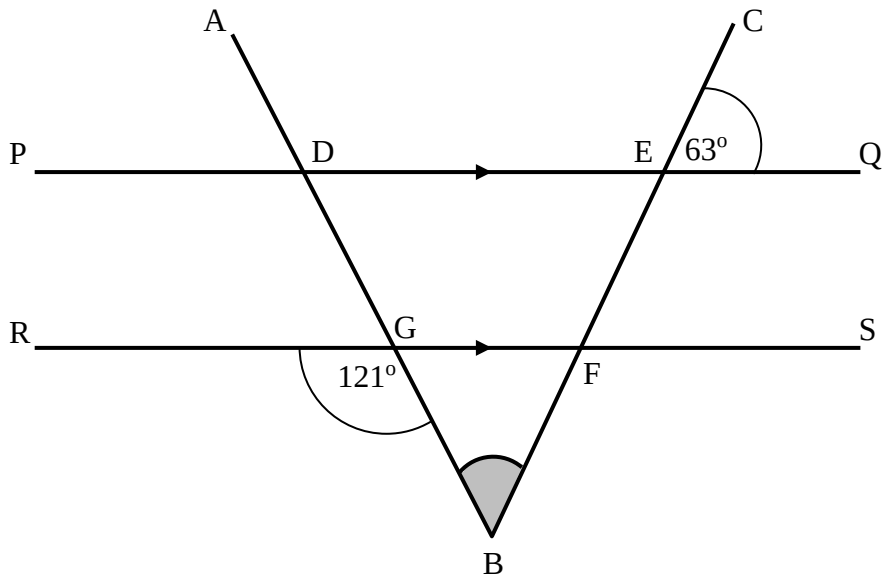
7. Draw an enlargement of the given shape using a scale factor of $\frac{5}{2}$.



8. In the diagram below, lines PQ and RS are parallel.

Lines BA and BC intersect PQ and RS at the points D, E, F and G as shown.

Angle CEQ is 63° and angle RGB is 123°.



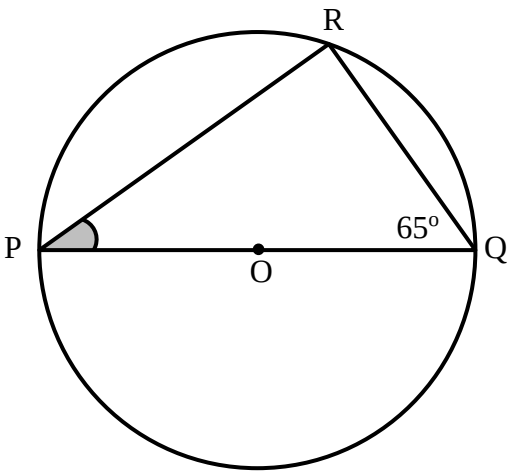
Calculate the size of angle ABC.

9. PQ is the diameter of a circle, centre O.

R is a point on the circumference of the circle.

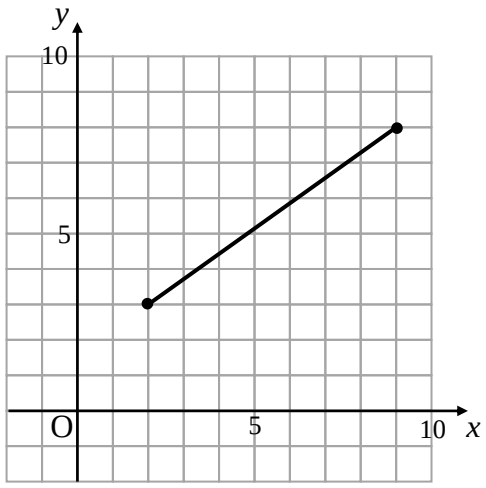
Angle PQR is 65°.

Calculate the size of the shaded angle QPR.

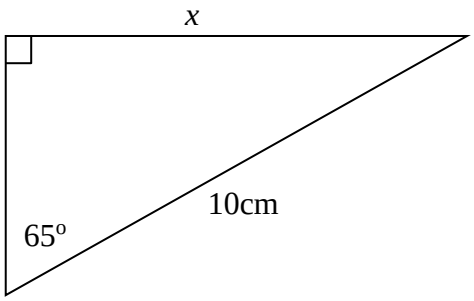


10. The end points of the line shown in the diagram have coordinates (2, 3) and (9, 8).

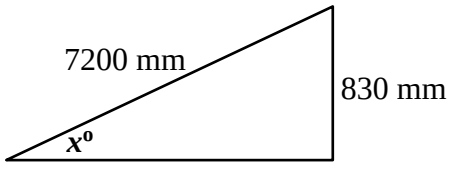
Calculate the length of the line.



11. Calculate the length of side *x* in the right-angled triangle below.



12. The diagram shows a ramp which has been manufactured for a shop entrance.



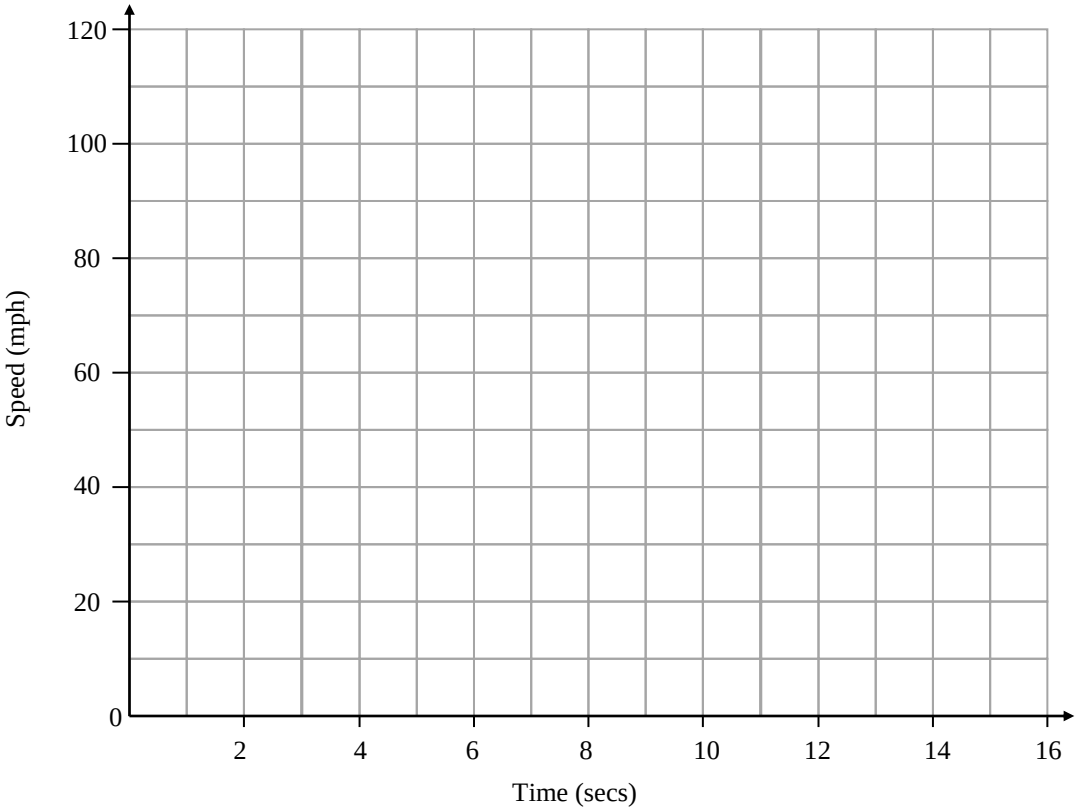
(a) Calculate the size of angle *x*.

(b) For the ramp to be safe for wheelchair users the angle *x* should be between 5° and 7°.
Is this ramp suitable for wheelchair users? (Justify your answer)

13. The following table shows the speed of a car accelerating from rest.

Time (secs)	0	2	6	8	12	16
Speed (mph)	0	10	50	60	80	110

(a) Draw a scattergraph of the information on this grid.



(b) Draw the best fitting line on the graph.

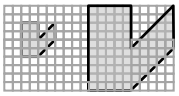
(c) Use your graph to estimate the speed after 10 seconds.

(d) A car travelling at a speed of 70 mph was estimated to have been accelerating for 10 seconds.
Is this a reasonable estimate?

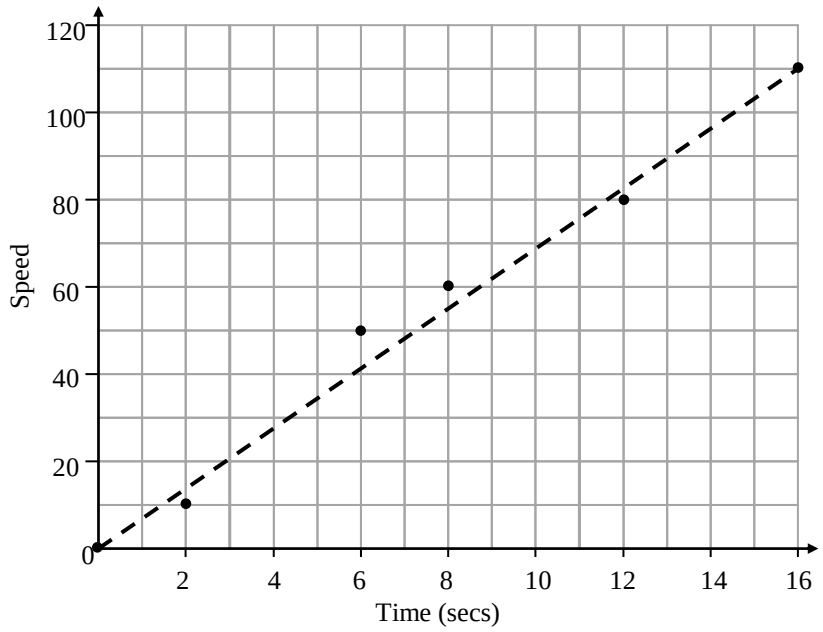
End of Question Paper

Practice Unit Assessment (1) for Relationships — Marking Scheme

Points of reasoning are marked # in the table.

Question	Main points of expected responses	
1	•[1] complete table of values •[2] points plotted •[3] line drawn	•[1] y = 3, 5 and 7 •[2] (1, 3), (2, 5), (3, 7) •[3] straight line graph of $y = 2x + 1$
2	•[1] line CD identified	•[1] $y = 2$
3	•[1] solve for $3y$ •[2] solve for y	•[1] $3y = -21$ •[2] $y = -7$
4	•[1] divide D by S	•[1] $T = D/S$
5	•[1] subtract 2 from a •[2] divide by 7	•[1] $7b = a - 2$ •[2] $b = \frac{a-2}{7}$
6	•[1] know to use Pythagoras •[2] correct use of Pythagoras •[3] correct answer	•[1] $BC^2 = 13^2 - 5^2 = 144$ •[2] $BC = \sqrt{(144)}$ •[3] BC = 12 m
7	•[1] 3 lines correct •[2] further 3 lines correct	•[1] •[2] 
8	#2.1 valid strategy •[1] third angle calculated	#2.1 63º and 59º within one of the triangles •[1] 58º
9	•[1] angle in semi-circle •[2] angles in a triangle	•[1] angle in semi-circle = 90º •[2] angle QPR = 180 – 90 – 65 = 25º
10	# 2.1 use valid strategy •[1] correct answer	#2.1 finds horizontal and vertical distances and applies Pythagoras' Theorem •[1] 8·6
11	•[1] use sine ratio correctly •[2] rearrange formula and show evidence of numerical value of ratio substituted •[3] determines side of triangle	•[1] $\sin 65° = \frac{x}{10}$ •[2] $x = 10 \times \sin 65°$ [stated or implied] •[3] x = 9·06 cm (rounding not required)
12 (a) **(b)**	•[1] use tangent ratio correctly •[2] calculate angle #2.2 valid conclusion	•[1] $\tan x° = \frac{830}{7200}$ •[2] xº = 6·6° #2.2 It can be considered safe as the angle is between 5 and 7 degrees.

13 (a)	•[1]	4 points correct on graph	•[1]	see below
	•[2]	2 further points correct	•[2]	see below
(b)	•[3]	valid line of best fit drawn	•[3]	valid line of best fit drawn
(c)	•[4]	speed estimated	•[4]	approximately 70 mph
(d)	#2.2	valid reading from graph	#2.2	this estimate is fine.



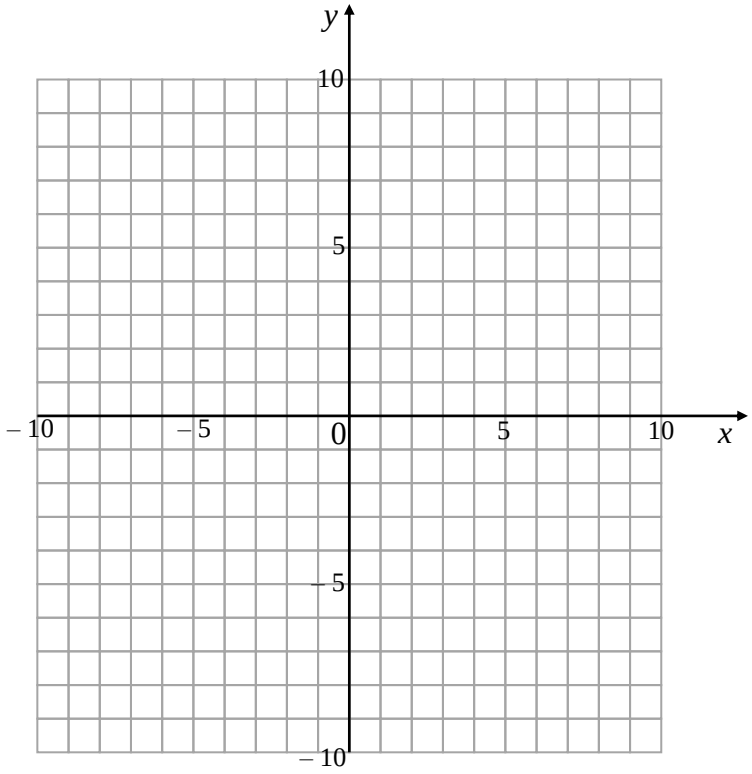
Practice Unit Assessment (2) for National 4 Relationships

Use the worksheet for Questions 1, 7 and 13

1. **(a)** Complete the table below for $y = \frac{1}{2}x + 2$

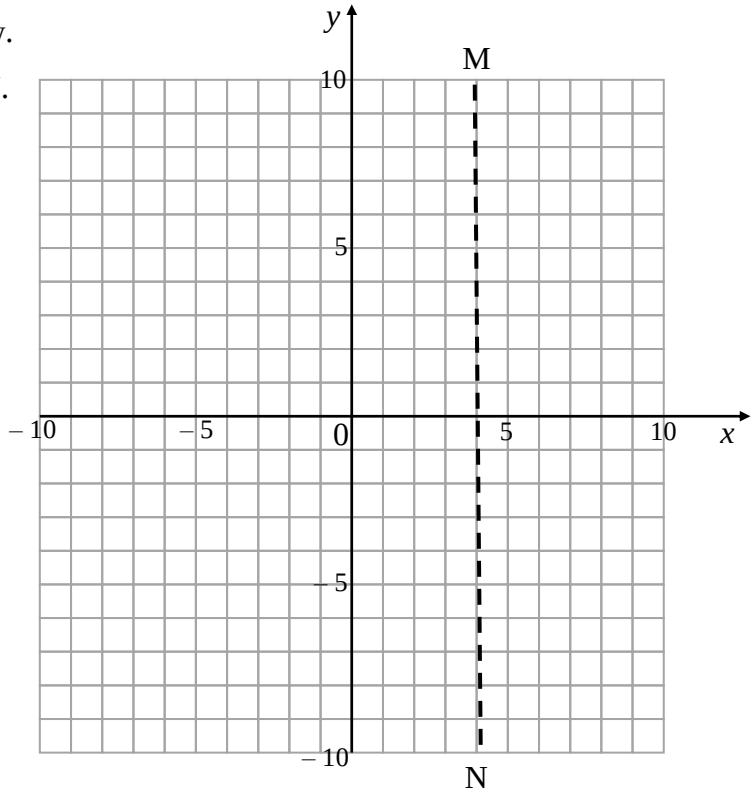
x	2	4	6
y			

(b) Draw the line $y = \frac{1}{2}x + 2$



2. Line MN is shown on the grid below.

Write down the equation of line MN.



3. Solve the following equation:

$$4y - 3 = 13$$

4. A formula used in Physics to find wavelength is $v = f\lambda$.

Change the subject of the formula to *f*.

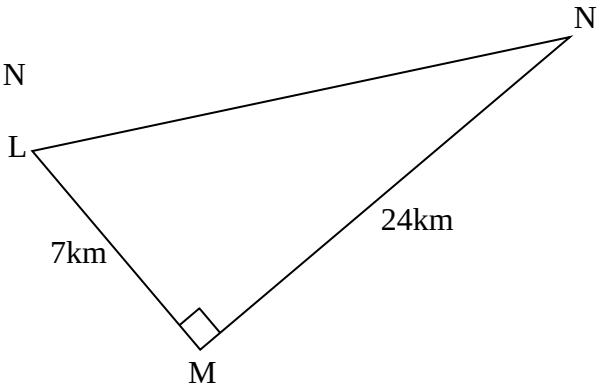
5. Change the subject of the formula

$y = 2x - 3$ to *x*.

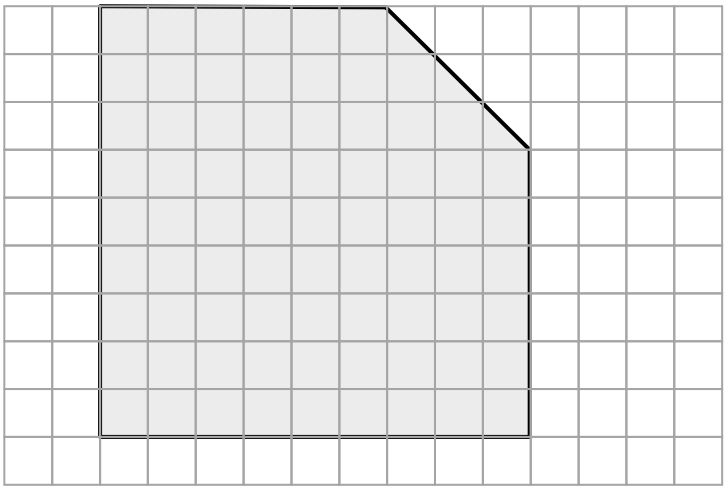
6. Triangle LMN represents a road network. It is a right-angled triangle.

The distance from L to M is 7 kilometres and from M to N is 24 kilometres.

Calculate the distance from L to N (in kilometres).



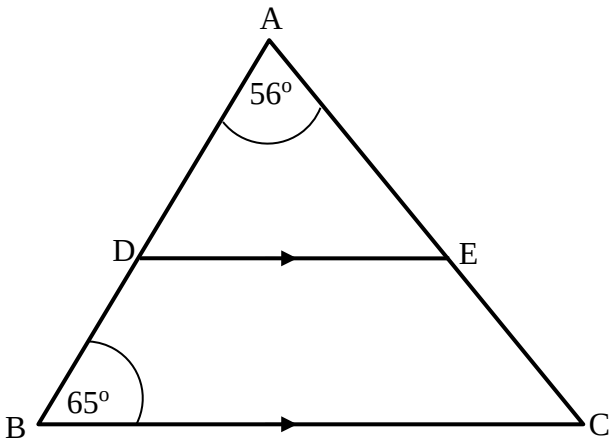
7. Draw an reduction of the given shape using a scale factor of $\frac{2}{3}$.



8. In the diagram below, lines DE and BC are parallel.

Point D lies on the line AB and the point E on the line AC.

Angle ABC is 65° and angle DAE is 56°.



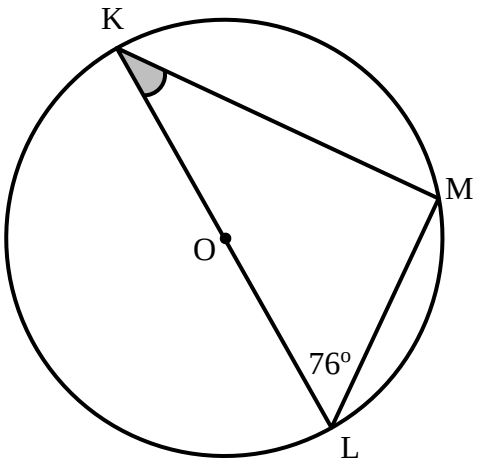
Calculate the size of angle AED.

9. KL is the diameter of a circle, centre O.

M is a point on the circumference of the circle.

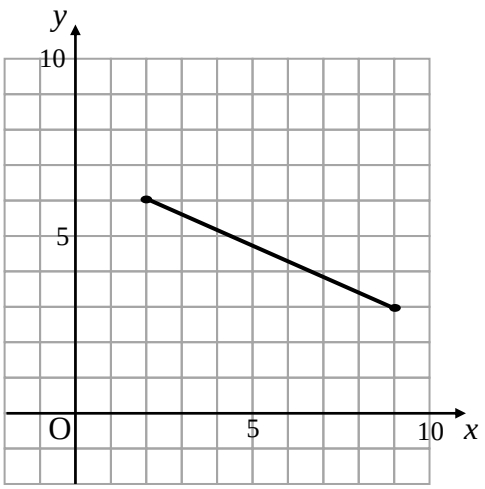
Angle KLM is 76°.

Calculate the size of the shaded angle MKL.

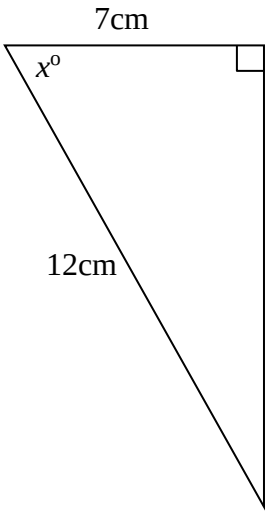


10. The end points of the line shown in the diagram have coordinates (2, 6) and (9, 3).

Calculate the length of the line.

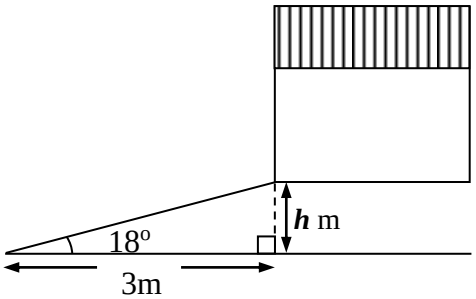


11. Calculate the size of the angle marked x^o in the right-angled triangle below.



12. A driveway leading up to a garage is 3 metres long and at an angle of 18^o to the horizontal.

(a) Calculate the height, ***h*** metres, which the ramp rises.

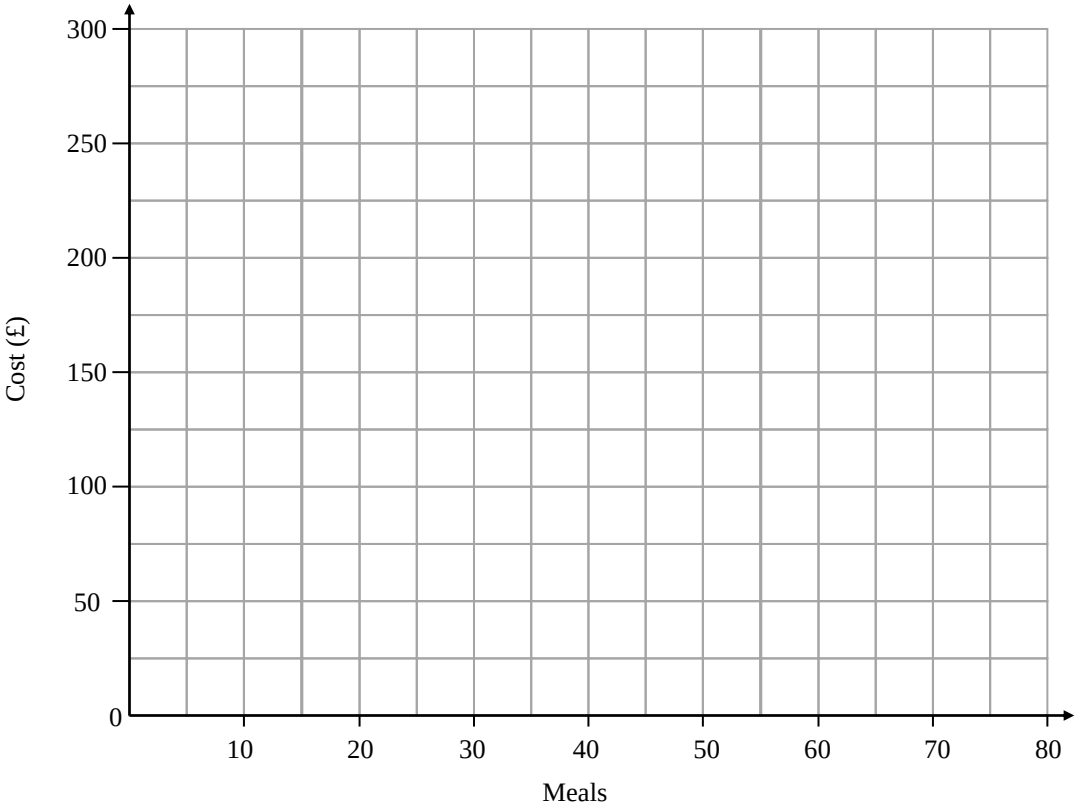


(b) For the driveway to pass regulations it rise by no more than 1 metre.
Would this driveway pass regulations? (Justify your answer)

13. A restaurant manager finds that the cost of running his restaurant depends on the number of meals served.

(a) Draw a scattergraph of the information on this grid.

Number of meals	10	20	30	40	50	60
Cost in £	125	175	175	225	225	275



(b) Draw the best fitting line on the graph.

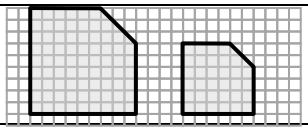
(c) Use your graph to estimate the cost of running the restaurant when 45 meals are served.

(d) The restaurant owner estimates the cost of running the restaurant when 75 meals were served would be £300.
Is this a reasonable estimate?

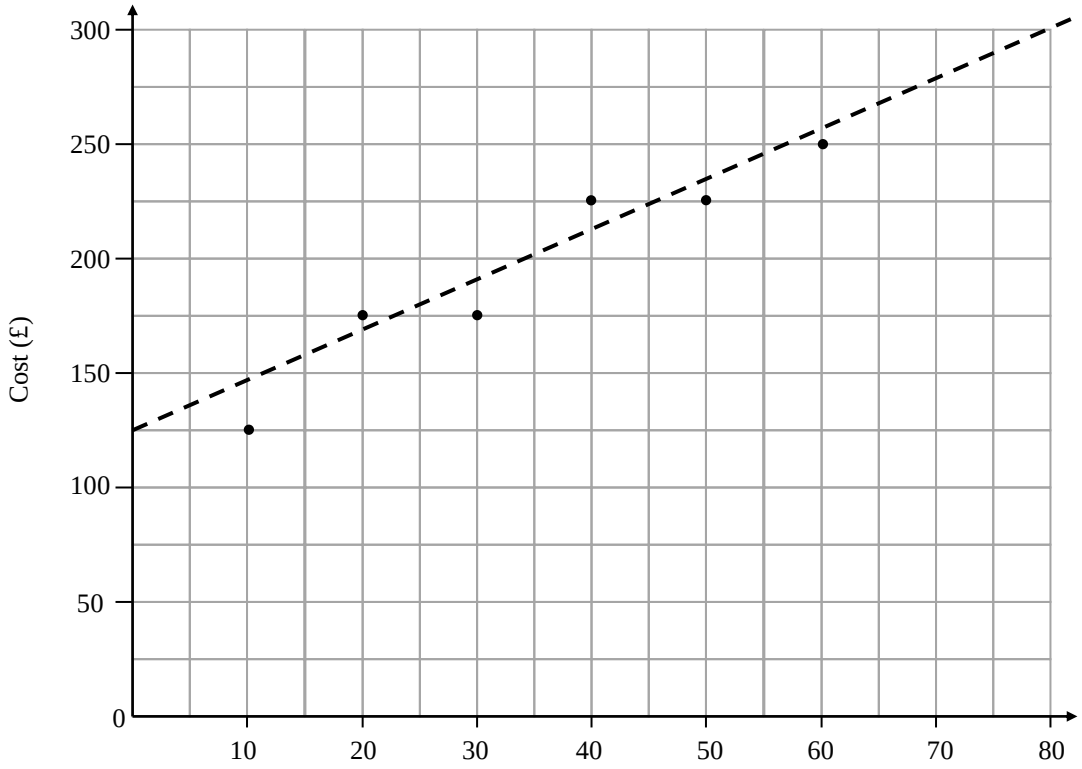
End of Question Paper

Practice Unit Assessment (2) for Relationships — Marking Scheme

Points of reasoning are marked # in the table.

Question	Main points of expected responses	
1	•1 complete table of values •2 points plotted •3 line drawn	•1 y = 3, 4 and 5 •2 (2, 3), (4, 4), (6, 5) •3 straight line graph of $y = \frac{1}{2}x + 2$
2	•1 line MN identified	•1 $x = 4$
3	•1 solve for $4y$ •2 solve for y	•1 $4y = 16$ •2 $y = 4$
4	•1 divide v by λ	•1 $f = v/\lambda$
5	•1 add 3 to y •2 divide by 2	•1 $2x = y + 3$ •2 $x = \frac{y+3}{2}$
6	•1 know to use Pythagoras •2 correct use of Pythagoras •3 correct answer	•1 $LN^2 = 24^2 + 7^2 = 625$ •2 $LN = \sqrt{(625)}$ •3 LN = 25 km
7	•1 3 lines correct •2 other lines correct	•1 •2 
8	#2.1 valid strategy •1 third angle calculated	#2.1 65º and 56º within one of the triangles •1 59º
9	•1 angle in semi-circle •2 angles in a triangle	•1 angle in semi-circle = 90º •2 angle KML = 180 – 90 – 76 = 14º
10	# 2.1 use valid strategy •1 correct answer	#2.1 finds horizontal and vertical distances and applies Pythagoras' Theorem •1 7·6
11	•1 use cosine ratio correctly •2 rearrange formula and show evidence of taking inverse •3 determines size of angle	•1 $\cos x° = \frac{7}{12}$ •2 $\cos^{-1}(7 \div 12)$ [stated or implied] •3 x = 54º (rounding not required)
12 (a) **(b)**	•1 use tangent ratio correctly •2 calculate h #2.2 valid conclusion	•1 $\tan 18° = \frac{h}{3}$ •2 h = 0·97 metres #2.2 It will pass since 0·97 < 1

13 (a)	•[1] 4 points correct on graph	•[1] see below
	•[2] 2 further points correct	•[2] see below
(b)	•[3] valid line of best fit drawn	•[3] valid line of best fit drawn
(c)	•[4] cost estimated	•[4] approximately £285
(d)	#2.2 valid reading from graph	#2.2 this estimate is about right.



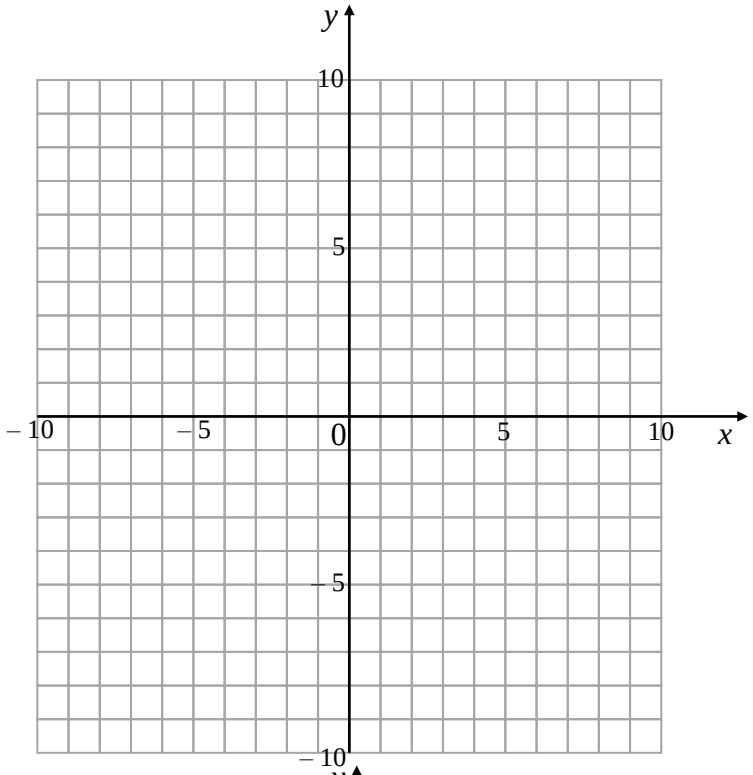
Practice Unit Assessment (3) for National 4 Relationships

Use the worksheet for Questions 1, 7 and 13

1. **(a)** Complete the table below for $y = 3x - 2$

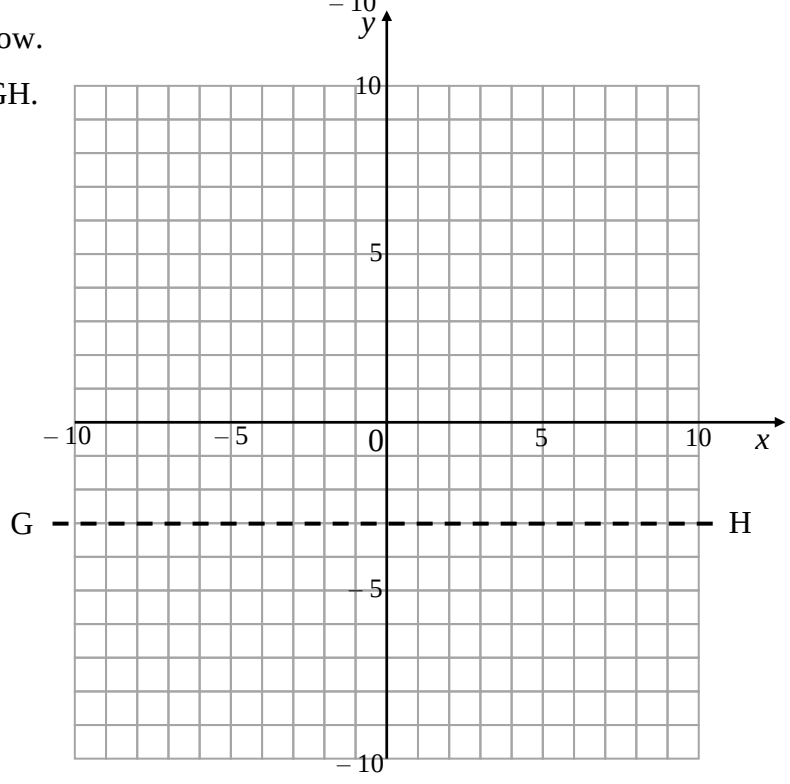
x	1	2	3
y			

(b) Draw the line $y = 3x - 2$



2. Line GH is shown on the grid below.

Write down the equation of line GH.



3. Solve the following equation:

$$8k + 3 = -21$$

4. The formula for find the circumference of a circle is $C = \pi D$.

Change the subject of the formula to *D.*

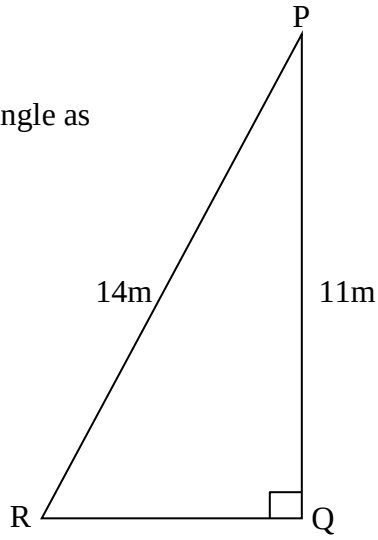
5. Change the subject of the formula

$$v = u + 6t \qquad \text{to } t.$$

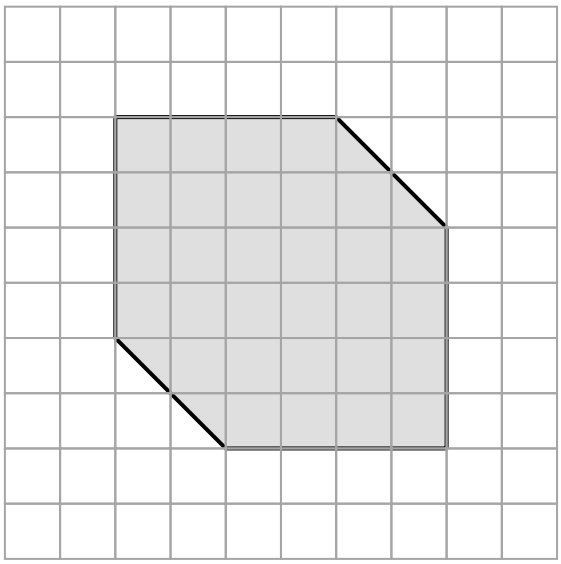
6. A piece of lawn in my garden is in the shape of a right – angled triangle as shown by triangle PQR in the diagram.

The distance PR is 14 metres and PQ is 11 metres.

Calculate the length RQ (in metres).



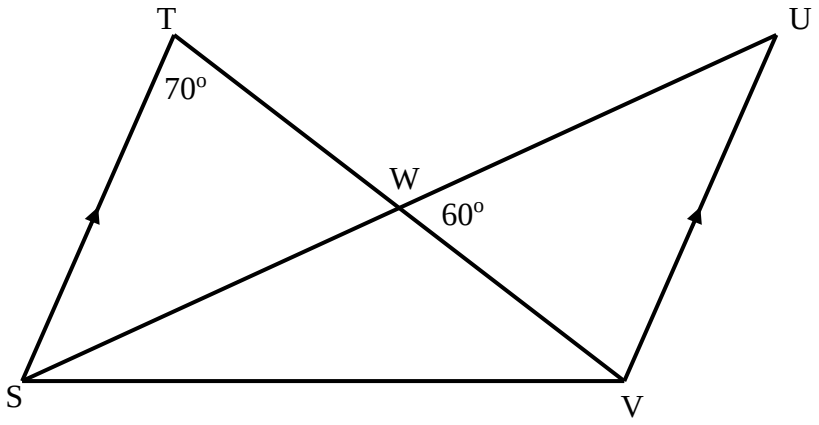
7. Draw a enlargement of the given shape using a scale factor of $\frac{3}{2}$.



8. In the diagram below, lines ST and VU are parallel.

W is the point of intersection of TV and SU.

Angle STV is 70° and angle UWV is 60°.



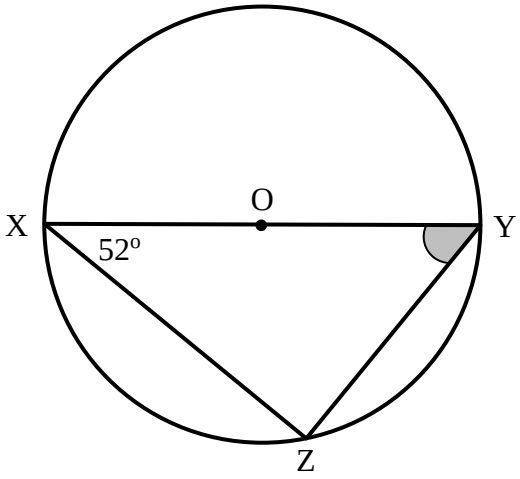
Calculate the size of angle SUV.

9. XY is the diameter of a circle, centre O.

Z is a point on the circumference of the circle.

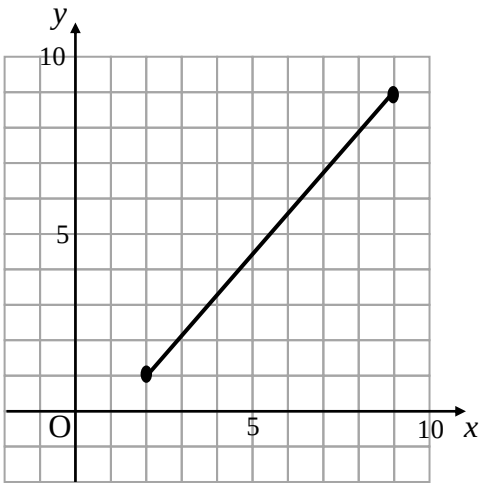
Angle ZXY is 62°.

Calculate the size of the shaded angle ZYX.

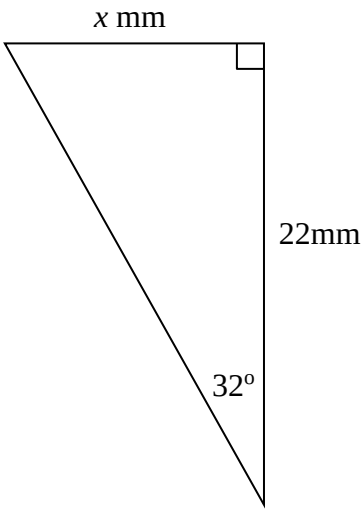


10. The end points of the line shown in the diagram have coordinates (2, 1) and (9, 9).

Calculate the length of the line.

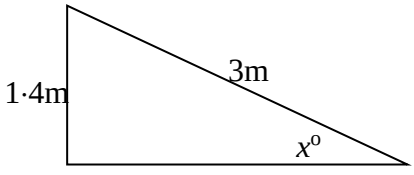


11. Calculate the length of side x in the right-angled triangle below.



12. A child's chute is 3 metres long and one end of it is 1·4 metres from the ground.

(a) Use the diagram below to help you calculate the angle, x^o, which the chute makes with the ground?

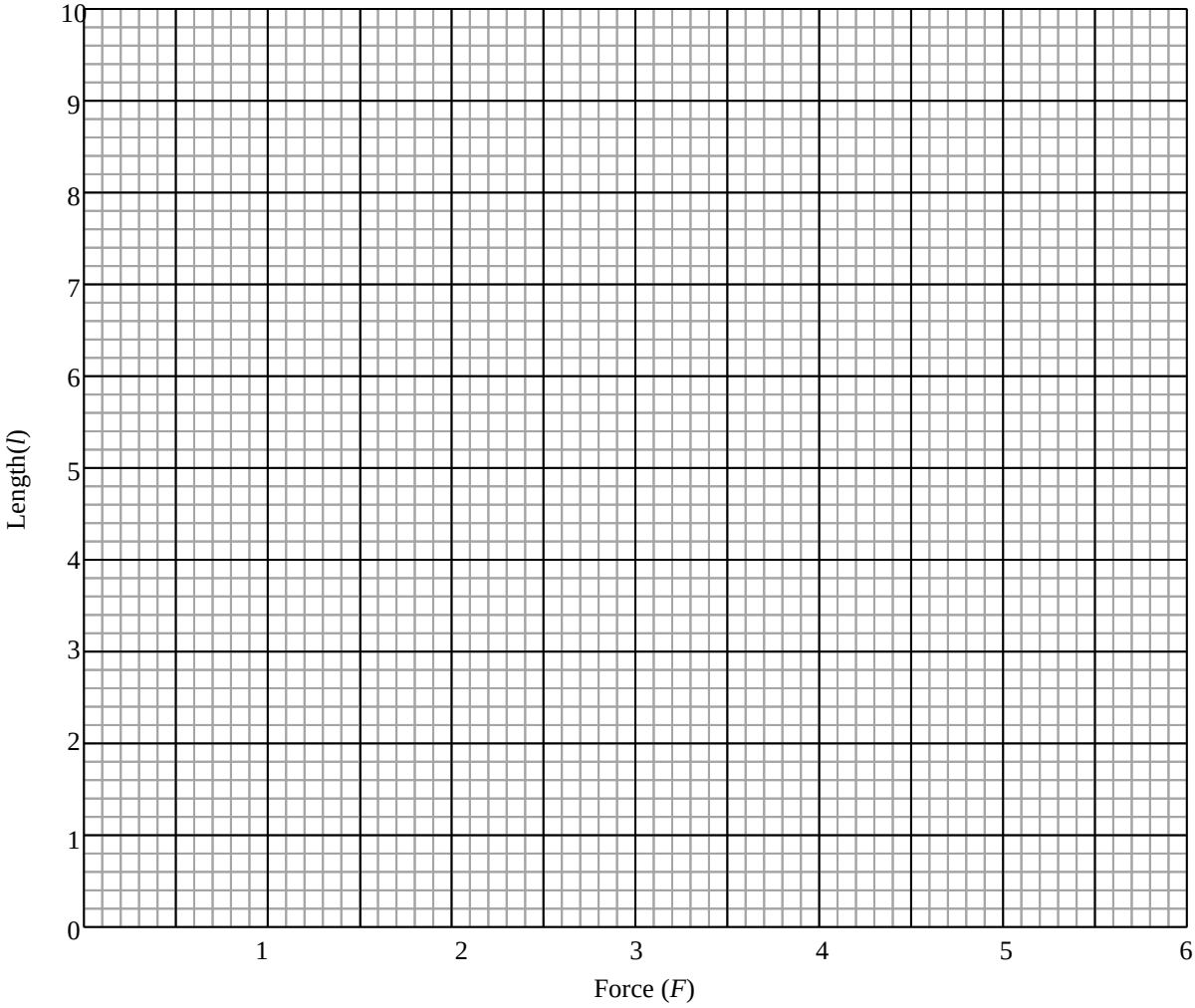


(b) To be safe the angle that the chute makes with the ground should be between 27^o and 28^o. Is this chute safe? (Justify your answer)

13. The results below show the length of a spring when a force is applied.

Force (F)	1	2	3	4	5	6
Length (l)	3·0	3·8	5·4	6·0	6·8	8·2

(a) Draw a scattergraph of the information on this grid.



(b) Draw the best fitting line on the graph.

(c) Use your graph to estimate the length of the spring when a force of 3·5 is applied.

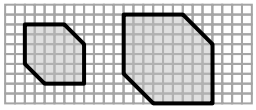
(d) It is estimated that the length of the spring should be 6·6 when a force of 4·5 is applied to it.

Is this a reasonable estimate?

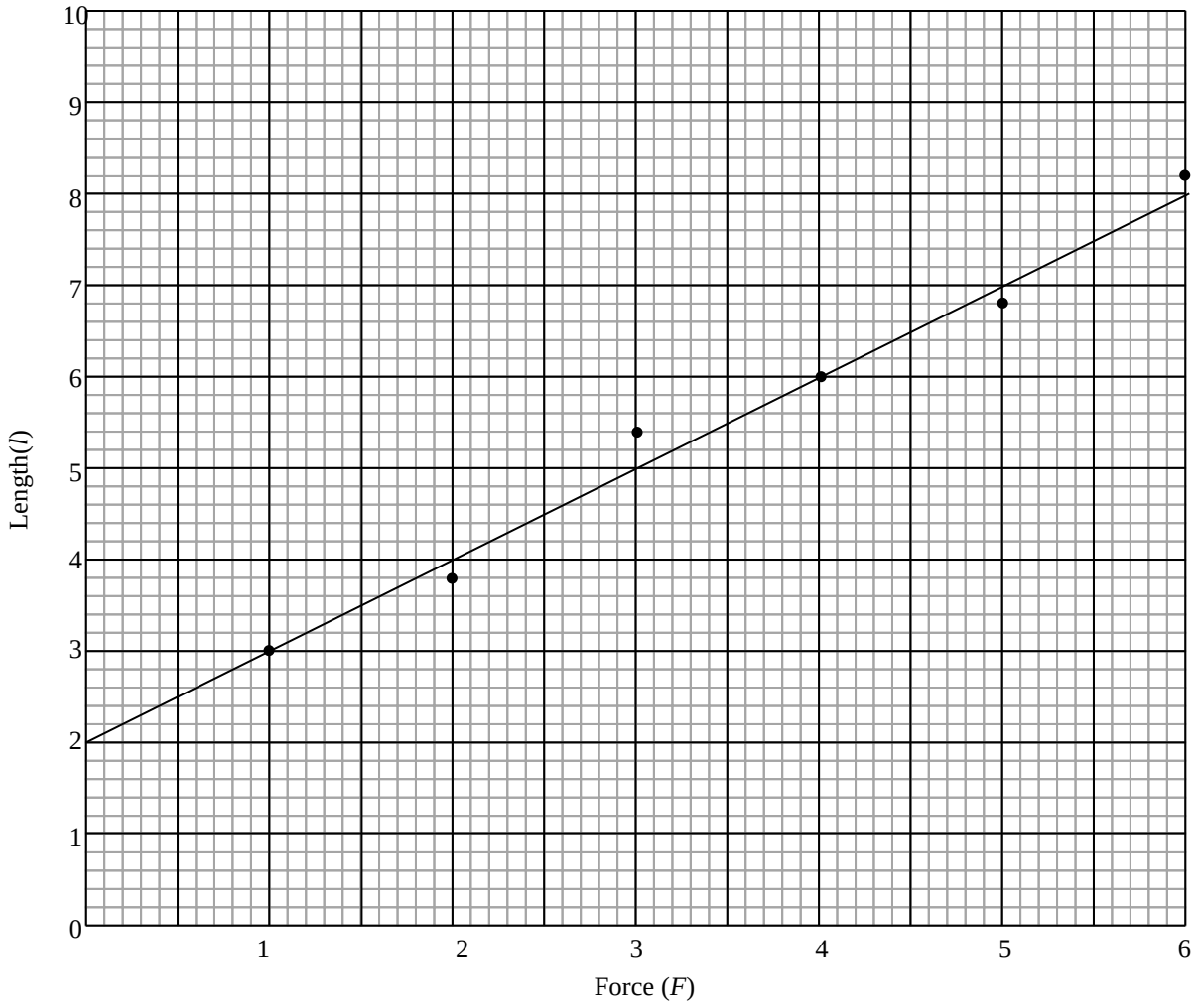
End of Question Paper

Practice Unit Assessment (3) for Relationships — Marking Scheme

Points of reasoning are marked # in the table.

Question	Main points of expected responses	
1	•[1] complete table of values •[2] points plotted •[3] line drawn	•[1] $y = 1$, 4 and 7 •[2] (1, 1), (2, 4), (3, 7) •[3] straight line graph of $y = 3x - 2$
2	•[1] line GH identified	•[1] $y = -3$
3	•[1] solve for $8k$ •[2] solve for k	•[1] $8k = -24$ •[2] $k = -3$
4	•[1] divide C by π	•[1] $D = C/\pi$
5	•[1] subtract u from v •[2] divide by 6	•[1] $6t = v - u$ •[2] $t = \frac{v-u}{6}$
6	•[1] know to use Pythagoras •[2] correct use of Pythagoras •[3] correct answer	•[1] $RQ^2 = 14^2 - 11^2 = 625$ •[2] $RQ = \sqrt{(75)}$ •[3] RQ = 8·7 m
7	•[1] 3 lines correct •[2] other lines correct	•[1] •[2] 
8	#2.1 valid strategy •[1] third angle calculated	#2.1 70° within triangle WVU •[1] 50°
9	•[1] angle in semi-circle •[2] angles in a triangle	•[1] angle in semi-circle = 90° •[2] angle KML = 180 – 90 – 52 = 38°
10	# 2.1 use valid strategy •[1] correct answer	#2.1 finds horizontal and vertical distances and applies Pythagoras' Theorem •[1] 10·6
11	•[1] use tangent ratio correctly •[2] rearrange formula and show evidence of numerical value of ratio substituted •[3] determines side of triangle	•[1] $\tan 32° = \frac{x}{22}$ •[2] $x = \tan 32° \times 22$ [stated or implied] •[3] x = 13·7 mm (rounding not required)
12 (a) **(b)**	•[1] use sine ratio correctly •[2] calculate angle #2.2 valid conclusion	•[1] $\sin x° = \frac{1 \cdot 4}{3}$ •[2] $x = 27 \cdot 8°$ #2.2 safe since 27·8° is between 27° and 28°

13 (a)	$\bullet^1$	4 points correct on graph	$\bullet^1$	see below
	$\bullet^2$	2 further points correct	$\bullet^2$	see below
(b)	$\bullet^3$	valid line of best fit drawn	$\bullet^3$	valid line of best fit drawn
(c)	$\bullet^4$	length estimated	$\bullet^4$	approximately 5·4
(d)	#2.2	valid reading from graph	#2.2	this estimate is good.

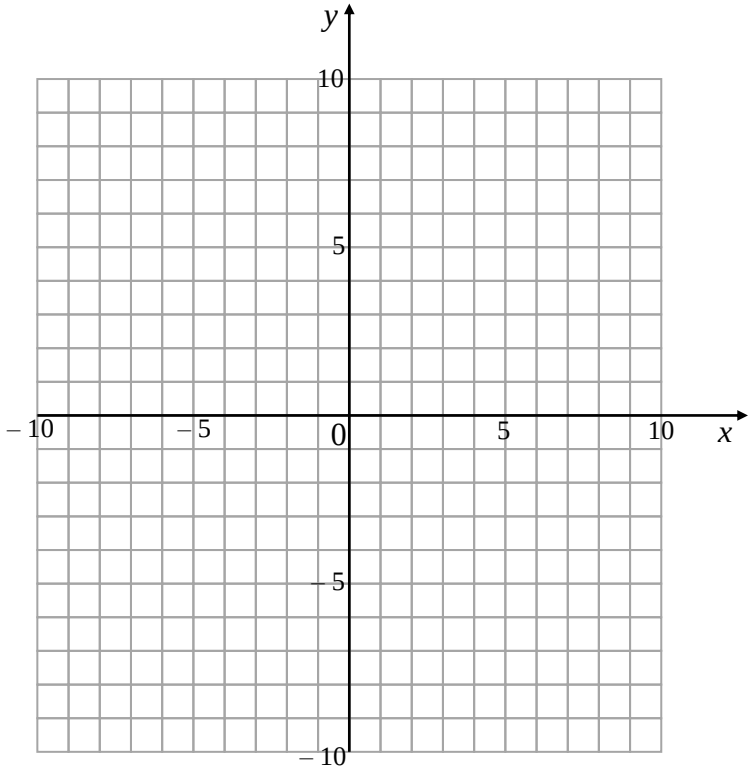


Practice Unit Assessment (1) for National 4 Relationships — Worksheet

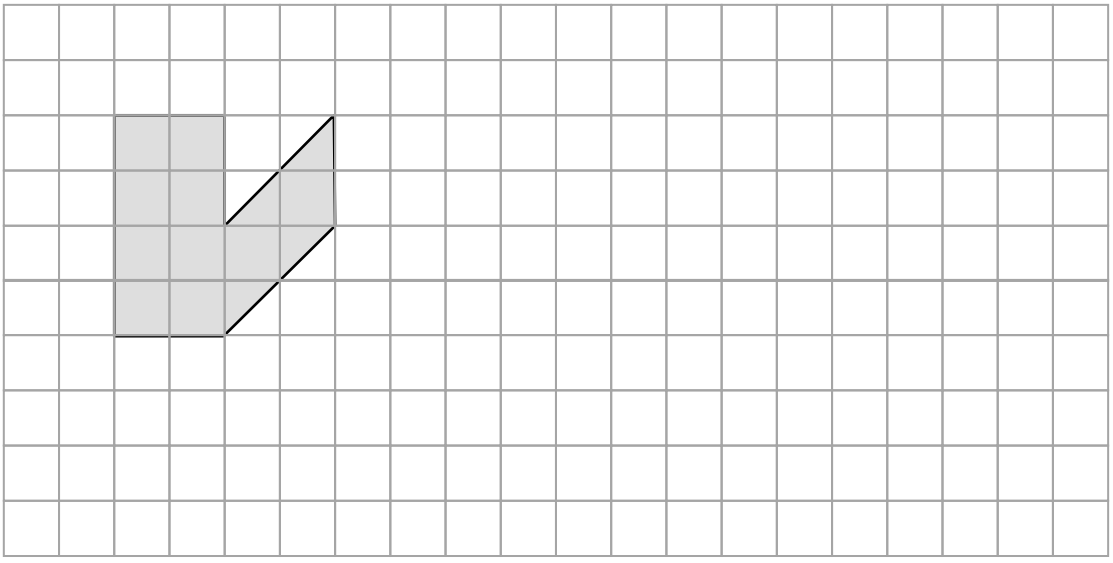
1. **(a)** Complete the table below for $y = 2x + 1$.

x	1	2	3
y			

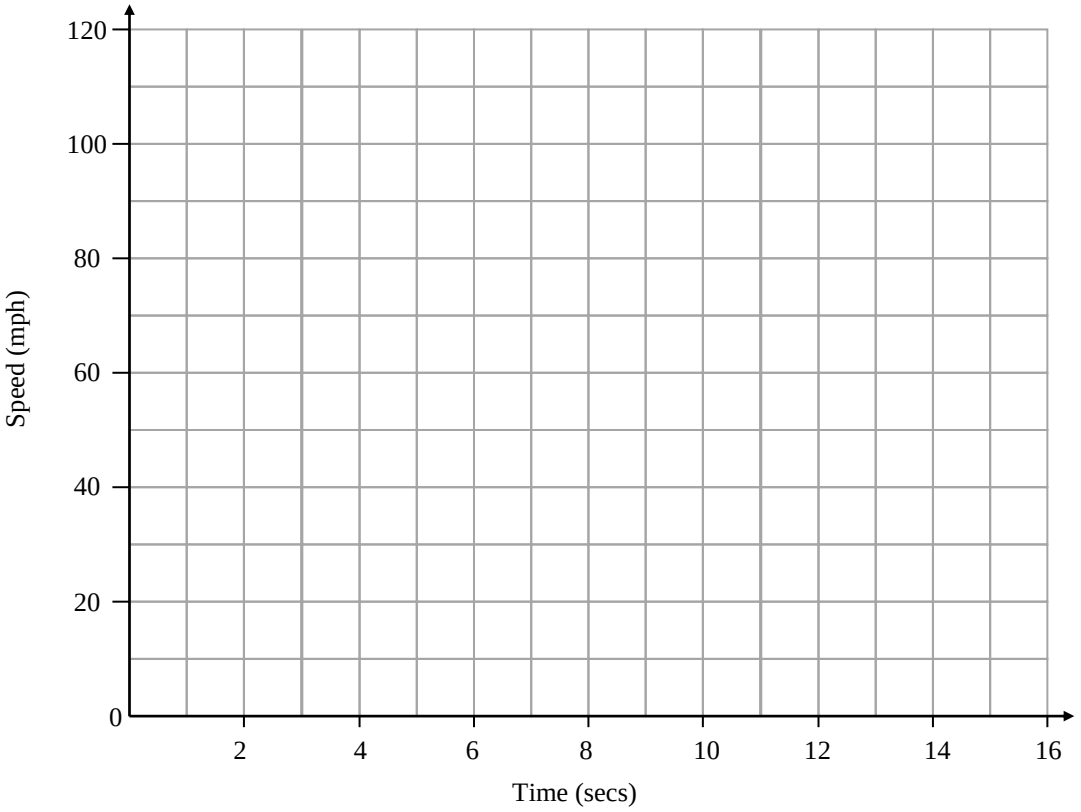
(b) Draw the line $y = 2x + 1$.



7. Draw an enlargement of the given shape using a scale factor of $\frac{5}{2}$.



13. **(a)** Draw a scattergraph of the information on this grid.



(b) Draw the best fitting line on the graph.

(c)

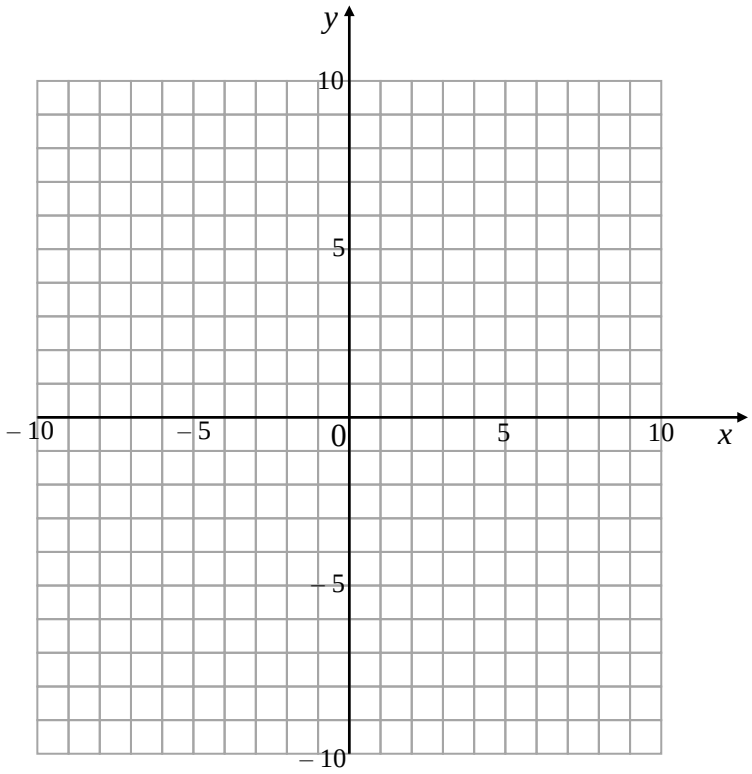
(d)

Practice Unit Assessment (2) for National 4 Relationships — Worksheet

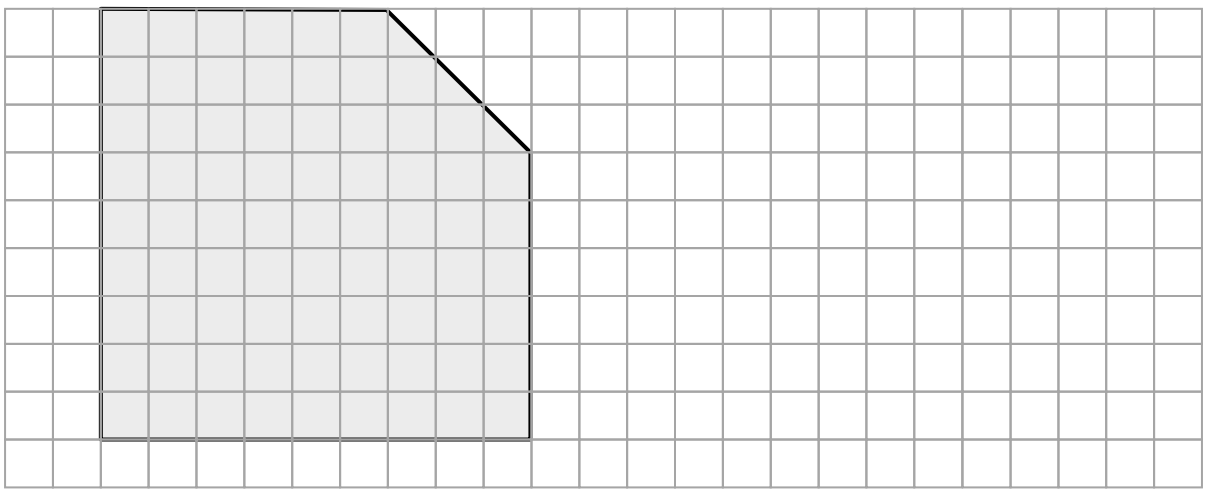
1. **(a)** Complete the table below for $y = \frac{1}{2}x + 2$

x	2	4	6
y			

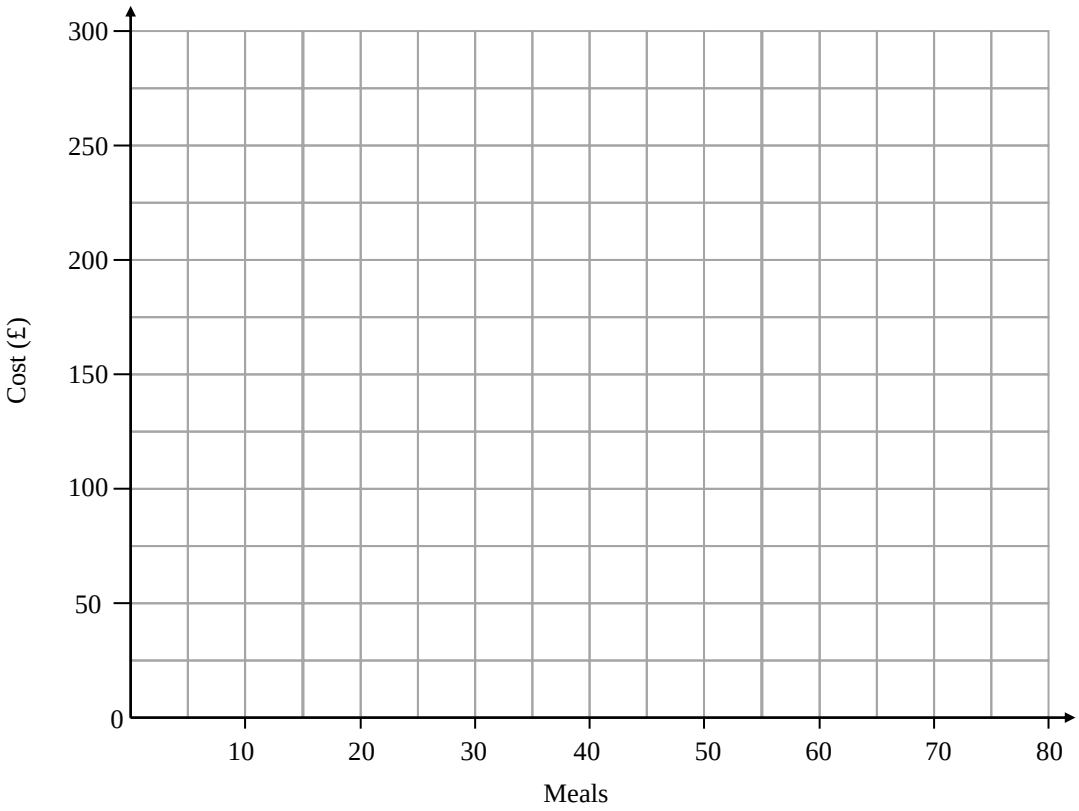
(b) Draw the line $y = \frac{1}{2}x + 2$



7. Draw an reduction of the given shape using a scale factor of $\frac{2}{3}$.



13. **(a)** Draw a scattergraph of the information on this grid.



(b) Draw the best fitting line on the graph.

(c)

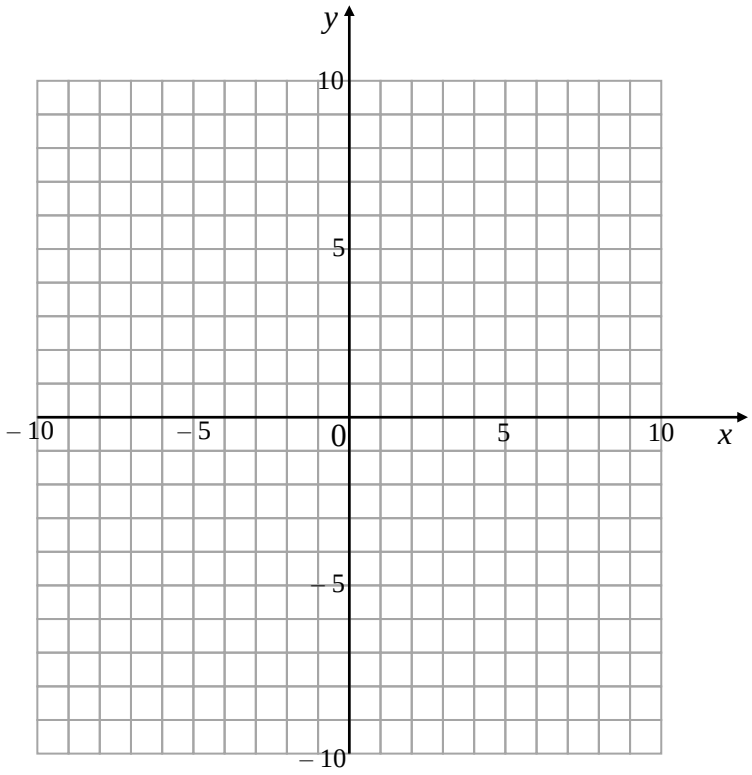
(d)

Practice Unit Assessment (3) for National 4 Relationships — Worksheet

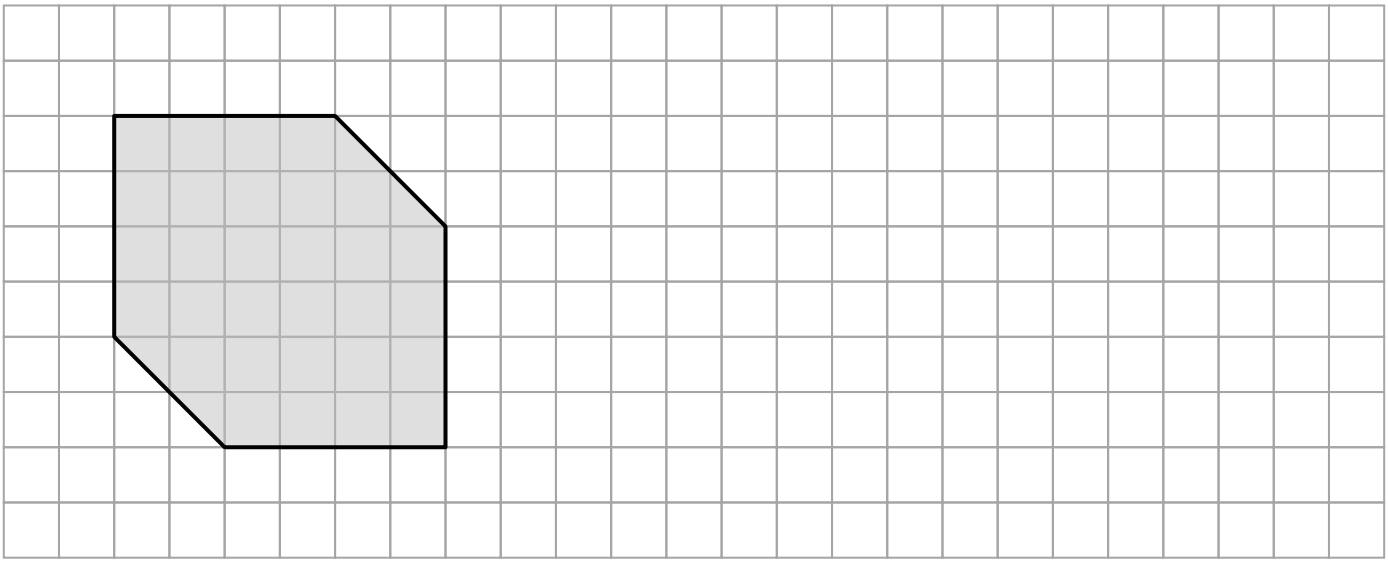
1. **(a)** Complete the table below for $y = 3x - 2$

x	1	2	3
y			

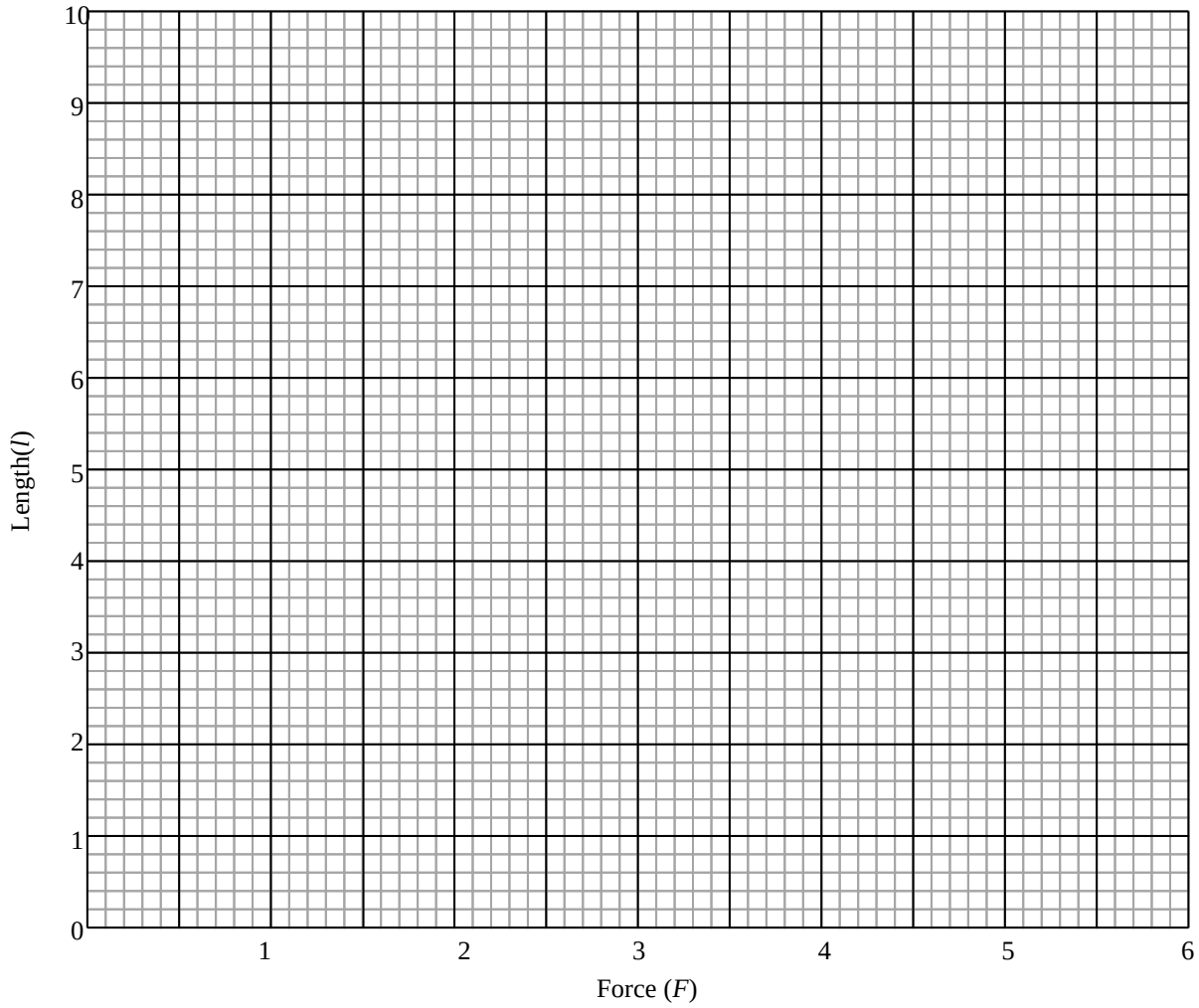
(b) Draw the line $y = 3x - 2$



7. Draw a enlargement of the given shape using a scale factor of $\frac{3}{2}$.



13. **(a)** Draw a scattergraph of the information on this grid.



(b) Draw the best fitting line on the graph.

(c)

(d)

Practice Unit Assessment (1) for National 4 Numeracy

1. I have just bought a new washing machine. The price was £400 + VAT.

VAT is charged at 20%.

What was the total price of the washing machine?

2. An empty container weighs 120g. When 50 lollipops were put in it the weight was 870g.

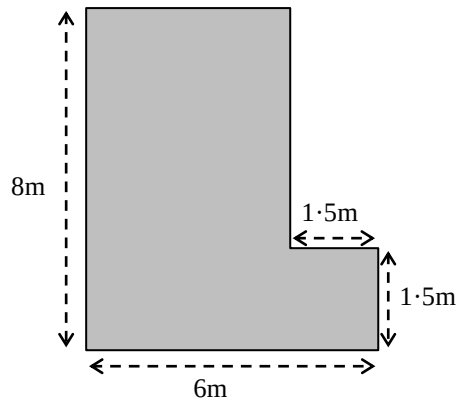
What is the weight of one lollipop?

3. Anne is going to Malta. How many euros will she get for £150 when the exchange rate is 1·18 euros to a pound?

4. Complete the following table which shows departure and arrival times for different bus journeys.

Depart	Arrive	Time taken
0315	0735	
1105		3h 15 min
	2100	4h 25 min

5. The diagram shows an L – shaped room which is made up from two rectangles.



A decorative border has to be put round the room. There is 25 metres on the roll.

Is the roll long enough for the room?

Justify your answer by calculation.

6. A car travels at a constant speed of 63 mph for 20 minutes.

How far does the car travel in this time?

7. After a lottery win of £350 000, the money was divided between the two winners, Charlie and Fred, in the ratio 3 : 4.

Fred received £200 000.

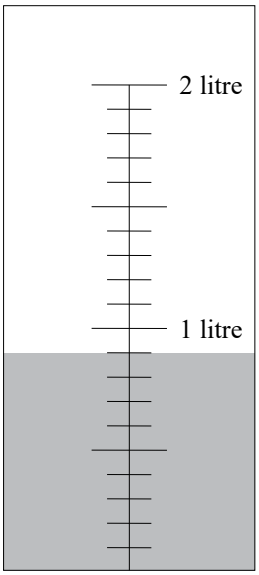
Is this the correct amount?

Justify your answer by calculation.

8. A liquid is warmed from – 6ºC to –2°C.

By how many degrees has its temperature risen?

9. Some water has been added to this measuring jar.



How much more water is needed to fill the jar to 1·5 litres?

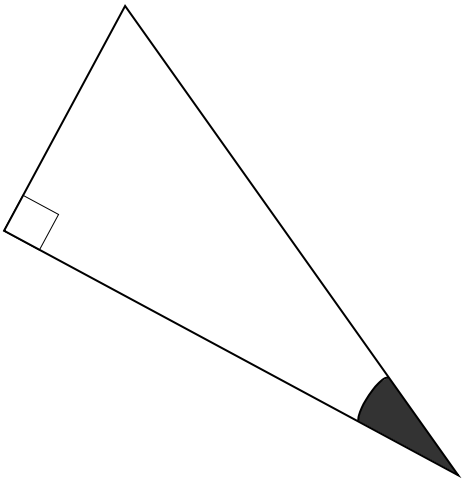
10. Two shops are selling the same holiday. They are offering these for sale with different deals.

Sun Holidays	Holiday Sun
Deposit £120 Six payments of £67·80	Deposit £170 Six payments of £58·30

Whi

Justify your answer by calculation.

11. This triangle is right-angled.



(a) Measure the length of the longest side.

(b) Measure the size of the shaded angle.

12. Carrots are being sold in different sizes of packet in the supermarket.

Pack A contains 400g of carrots and costs £1.20

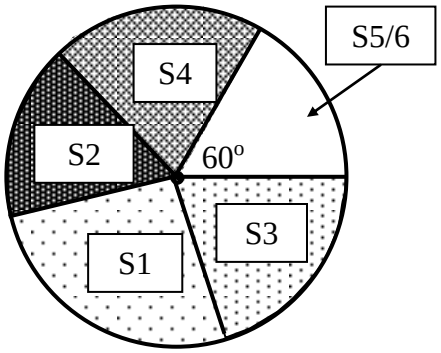
Pack B contains 200g of carrots and costs 65p

Fiona needs to buy at 1000g of carrots as cheaply as she can.

How many packs of each size should she buy?

How much will this cost?

13. The number of pupils in each year group in a secondary school was recorded and this pie chart drawn.



There are 1200 pupils in the school.

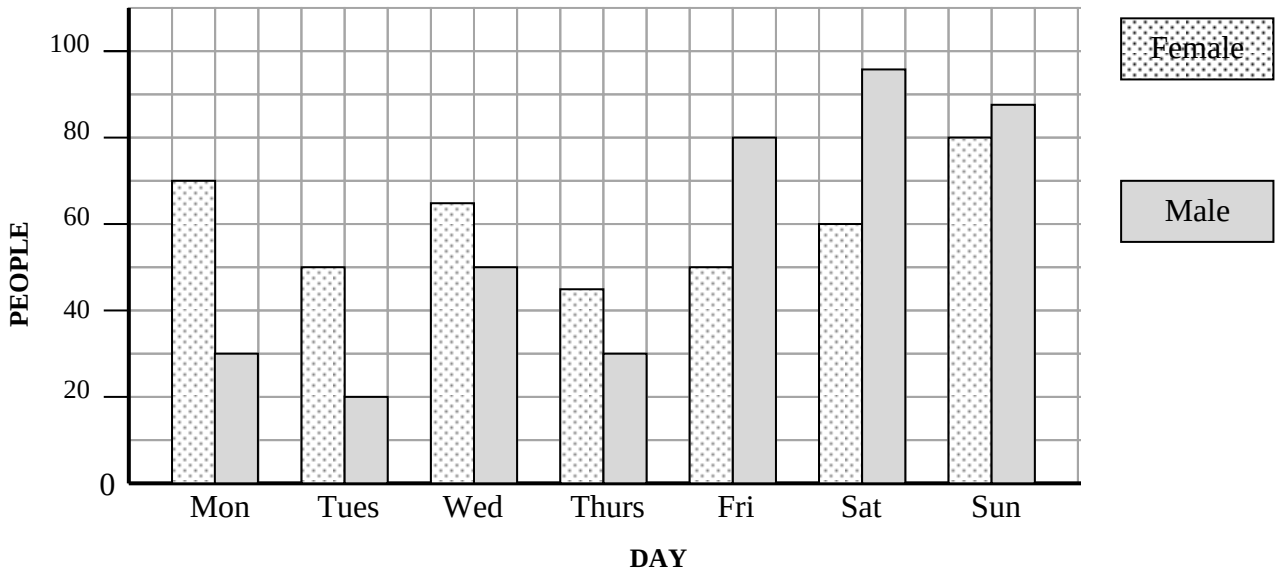
How many pupils were there in S5/6?

14. The table below shows the amount of yearly interest a selection of banks will pay to a customer on savings.

Bank	Less than £1000	£1000 to £5000 (inc)	Between £5000 and £10000	£10000 or more
A	0·5%	0·6%	0·8%	1%
B	0·6%	0·7%	0·9%	1·1%
C	0·5%	0·8%	0·8%	1%
D	0·5%	0·6%	0·7%	0·9%

For a savings amount of £6000, which bank would pay the most interest?

15. The number of people using a gym each day was recorded for a week and this compound bar chart was drawn.



(a) How many males used the gym on Friday?

(b) Compare the use of the gym by both males and females across the week.

16. Three mobile phone companies each have a contract available at the same price.

	Company A	**Company B**	**Company C**
Calls (minutes)	100	120	130
Texts	1000	750	800
Internet (Mb)	150	160	140

Amina is looking for a mobile phone contract which will give her 90 minutes of calls, 900 texts, and 140Mb of internet use.
Which company's plan would be best for her?

17. Tickets are being sold for two different prizes at a fayre.
Corinne has tickets for both.

80 tickets have been sold for prize A and 120 tickets have been sold for prize B.
Corinne has 5 tickets for prize A and 8 tickets for prize B.

Which prize has Corinne the better chance of winning?
Justify your answer by calculation.

18. Sally scored the following marks in three of her tests.

Maths: 25 out of 40
English: 32 out of 50
Science: 38 out of 60

In which subject did she do best in?
Justify your answer by calculation.

End of Question Paper

Practice Unit Assessment (1) for Numeracy **Marking Scheme**

		Response
1	Percentage calculation Addition	20% of 400 = 800 £480
2	Subtraction Division	870 – 120 = 750 750/50 = 15 g
3	Multiplication	150 × 1·18 = 177 euros
4	Subtraction Addition Subtraction	4 hours 20 mins 1420 1635
5	Perimeter calculation	P = 28 m #No, 28 m > 25 m
6	Division	63/3 = 21 miles
7	Ratio/proportion Ratio/proportion	350000/7 = 50000 50000 × 4 = 200000 # Yes, correct
8	Difference	4 degrees
9	-	#600 ml
10	Decimal multiplication	406·80 or 349·80 526·80 or 519·80 #Holiday Sun less
11	- -	#Length measure 7·6 cm (nearest 0·1cm) #Angle measure 26^{o} (± one degree)
12	-	# 2 of pack A and 1 of size B £3.05
13	Fraction	#60/360 of 1200 200
14	-	# Bank B

15	-	# 80 males # More females use the gym from Monday to Thursday but more males use it at the weekend.
16	-	# Company A is most suitable
17	-	#Prize B Evidence of 5/80 = 0·0625 and 8/120 = 0·0666… or equivalent
18	-	# English Evidence of 25/40 = 0·625 32/50 = 0·64 38/60 = 0·63 or equivalent

Practice Unit Assessment (2) for National 4 Numeracy

1. My account for heating fuel amounted to £360 plus VAT.

VAT is charged at 8%.

How much did I pay altogether to the fuel company?

2. A cardboard box weighs 300g. When 12 tins of beans are added, the total weight of the box and the tins is 5·1kg.

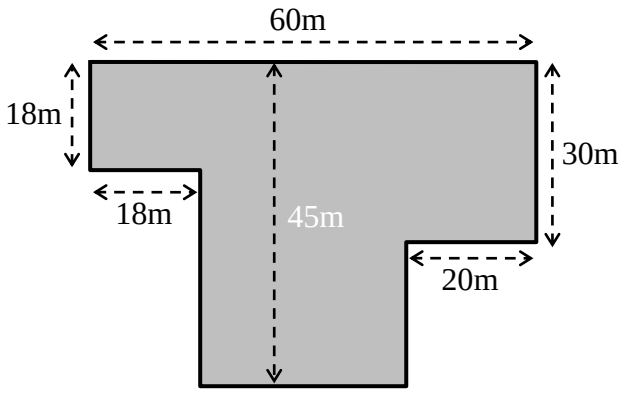
What is the weight of one tin of beans?

3. Irene is going to Australia on holiday. How many Australian dollars will she get for £620 when the exchange rate is 1·54 Australian dollars to a pound?

4. Complete the following table which shows start and end times for three TV programmes.

Start	End	Length
0950	1040	
1255		2h 35 min
	2120	1h 55 min

5. The diagram shows the plan for the playing fields at a sports centre.



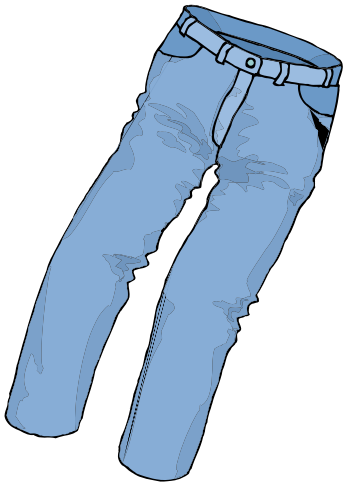
A fence has to be constructed round the perimeter of the playing fields.

The manager has ordered 200 metres of fencing.

Has the manager ordered enough fencing?

Justify your answer by calculation.

6. In a factory a woman can attached labels to a pair of jeans at a rate of 42 pairs per hour.



How many pair of jeans can she attached labels to in 10 minutes?

7. To make a fruit punch orange juice and apple juice are mixed together in the ratio 3 : 1.

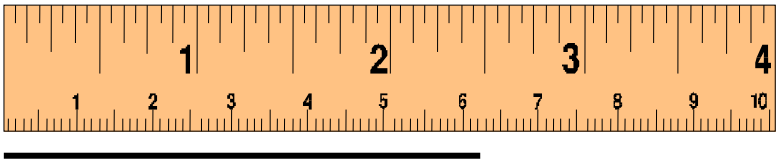
Beth wanted to make 16 litres of punch and calculates that she would need 12 litres of orange juice.

Is this correct?

Justify your answer by calculation.

8. The temperature of the freezer was –8°C. Due to an electrical fault the temperature rose by 11°C.
What was the temperature then?

9. The line in the diagram has to be extended to be 9·5cm.



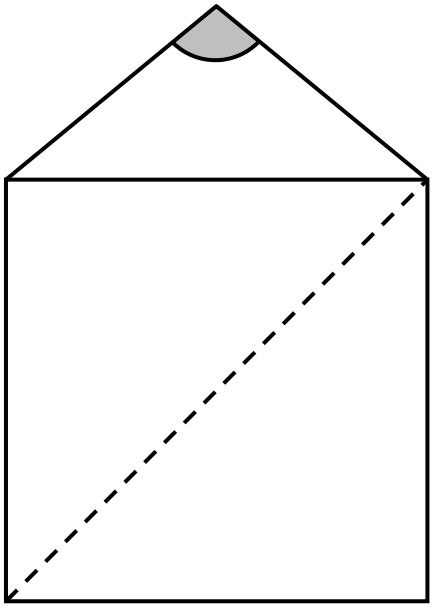
By what length must the line be extended?

10. Two stores are offering deals on the same washing machine.
The details of the deals are shown here.

Shop A	Shop B
Deposit: £100 24 payments of £12	Deposit: Nil 30 payments of £13

Which company is giving the best deal?
Justify your answer by calculation.

11. This diagram shows a square and a triangle.



(a) Measure the length of the diagonal of the square.

(b) Measure the size of the shaded angle.

12. Packs of washing sachets come in different sizes.

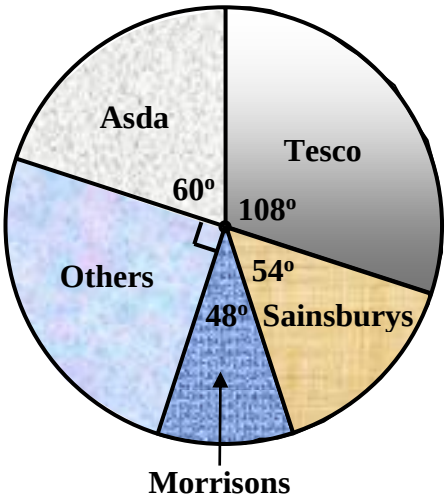
Pack A has 20 sachets and costs £4.

Pack B has 30 sachets and costs £7.

Write down two ways of buying exactly 60 sachets.

Which of these two ways is the cheaper option and how much cheaper this option?

13. The pie chart shows the approximate share of the market held by several leading supermarkets.



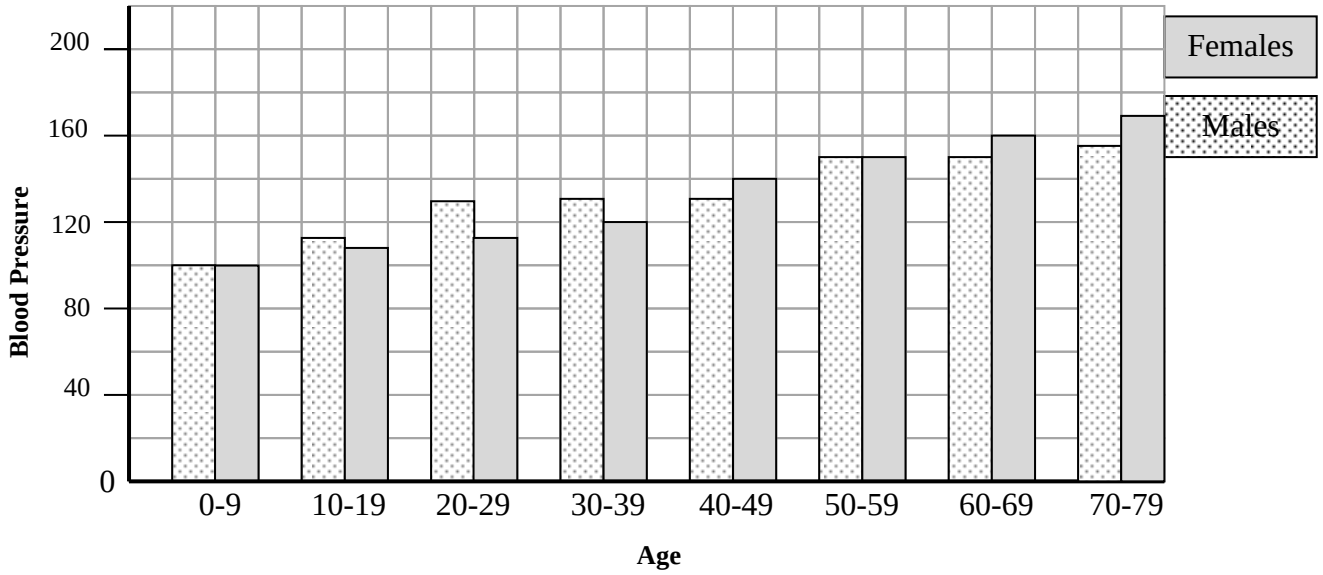
If £9 000 000 000 was spent in Britain's supermarkets last year, calculate how much was spent in Morrisons.

14. This table shows the number of rolls of wallpaper required for different sizes of rooms:

Height from ceiling to floor	**Width round room**							
	9m	**10m**	**12m**	**13m**	**14m**	**15m**	**17m**	**18m**
0·75 – 1·00m	2	3	3	3	3	4	4	4
1·00 – 1·25m	3	3	4	4	4	5	5	5
1·25 – 1·50m	3	4	4	5	5	5	6	6
1·50 – 1·75m	4	4	5	5	6	6	6	7
1·75 – 2·00m	4	5	5	6	6	7	7	8
2·00 – 2·15m	4	5	5	6	6	7	7	8
2·15 – 2·38m	4	5	5	6	6	7	7	8

Use the table to decide how many rolls of wallpaper would be needed for a room of height 2·1 metres and width round room of 13 metres.

15. The compound bar graph shows how blood pressure varies with age in males and females.



(a) In which age range is the difference between males and females the greatest?

(b) Describe the relationship between age and blood pressure.

16. Seven pupils in a class had their heights and weights measured. The results are shown in the table.

Name	Height (cm)	Weight (kg)
Liam	168	64
Steven	180	79
Gemma	174	66
Susan	181	75
David	159	78
Ryan	163	69
Emma	145	67

Who weighs more than 70 kg and is less than 180 cm tall?

17. Which of the following is the more likely to occur?
Choosing a club from a pack of cards OR throwing a number less than 3 on an ordinary die.
Justify your answer by calculation.

18. Three classes in a school were given the same test. The pass rate for each class is given here.

Class A: 26 out of 30 pupils passed
Class B: 21 out of 25 pupils passed
Class C: 19 out of 22 pupils passed

Which class had the best pass rate?
Justify your answer by calculation.

End of Question Paper

Practice Unit Assessment (2) for Numeracy **Marking Scheme**

		Response
1	Percentage calculation Addition	8% of 360 = £28.80 £388.80
2	Subtraction Division	5100 – 300 = 4800 4800/12 = 400 g
3	Multiplication	620 × 1·54 = 954.8 dollars
4	Subtraction Addition Subtraction	50 mins 1530 1925
5	Perimeter calculation	P = 210 m #No, 200 m < 210 m
6	Division	42/6 = 7 pairs
7	Ratio/proportion Ratio/proportion	16/4 = 4 4 × 3 = 12 # Yes, correct
8	Difference	3ºC
9	-	#3·3cm
10	Decimal multiplication	288 or 390 388 or 390 #Shop A
11	- -	#Length measure 7·9 cm (nearest 0·1cm) #Angle measure 99º(± one degree)
12	-	# 3 of pack A OR 2 of pack B 3 of pack A is £2 cheaper than 2 of pack B
13	Fraction	#48/360 of 9000000000 1200000000

14	-	# 6 rolls
15	-	# 20 – 29 # The older you get the higher your blood pressure
16	-	# David
17	-	#Throwing a die Evidence of 13/52 = 0·25 and 2/6 = 0·33333… or equivalent
18	-	# Class A Evidence of 26/30 = 0·86666… 21/25 = 0·84 19/22 = 0·86364 or equivalent

Practice Unit Assessment (3) for National 4 Numeracy

1. At the moment Jay pays £32 per month for his mobile phone.

The phone company has informed him that there will be an increase of 15%.
Calculate the new cost per month.

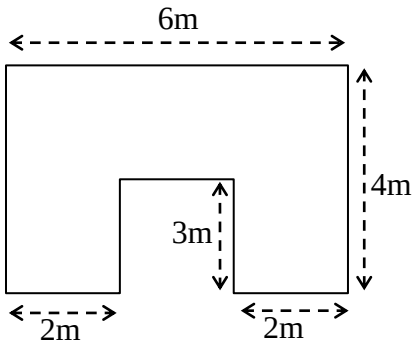
2. The total weight of a box of 60 chocolate biscuits is 1350 grams. The empty box weighs 150g.
What is the weight of one chocolate biscuit?

3. Jackie is going to the USA on holiday. How many dollars will she get for £550 when the exchange rate is 1·52 dollars to a pound?

4. Complete the following table which shows departure and arrival times for different train journeys.

Depart	Arrive	Time taken
1020	1315	
1425		4h 40 min
	1910	2h 20 min

5. The diagram shows the ground plan of a flat. It is made up from 3 rectangles. The dimensions are shown in the diagram



A decorative rail has to be put round the whole outline. James has 28 metres of rail.
Is the roll long enough for the outline?
Justify your answer by calculation.

6. A train travels at a constant speed of 105 km/h for 12 minutes.

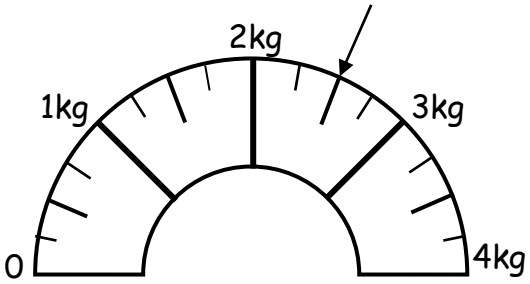
How far does the train travel in this time?

7. At the cinema, the ratio of adults to children was 2 : 3. There were 250 people in the cinema. The manager calculated that there were 150 adults.
Is this correct?
Justify your answer by calculation.

8. The temperature in Glasgow at 8.00 am was –2°C. By noon it was 3°C .

By how many degrees had the temperature risen?

9. The scale shows the weight of some apples. What weight of apples has to be added to make the total 4kg?

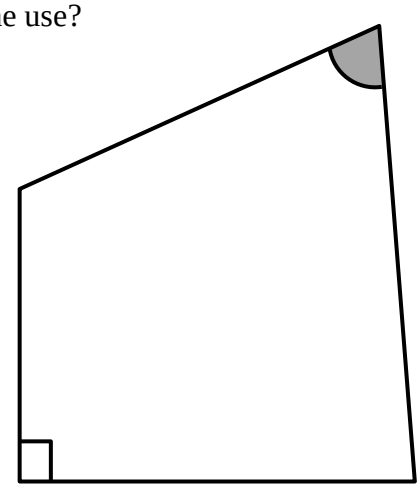


10. Two shops are offering a deal on the same mobile phone.
The details of the deals are shown here.

Shop A		**Shop B**	
Monthly charge:	£21	Monthly charge:	£25
Cost per text:	12p	Cost per text:	10p

Vanessa sends 100 texts each month. Which company should she use?
Justify your answer by calculation.

11. This diagram shows a quadrilateral with a right - angle.



(a) Measure the length of the longest side.

(b) Measure the size of the shaded angle.

12. Bags of potting compost are being sold in different sizes and with different offers.

Bag A contains 50 litres of compost cost £4 each or 3 for £10.

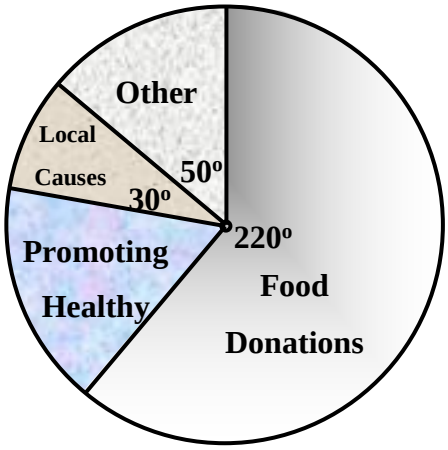
Bag B contains 20 litres of compost cost £2 each or 3 for £5.

Dermot needs to buy 210 litres of compost.

How many bags of each size should he buy?

How much will this cost?

13. A well known supermarket produced this pie chart to show how they supported projects in their local community last year.



The total donated to these causes amounted to £63 420.

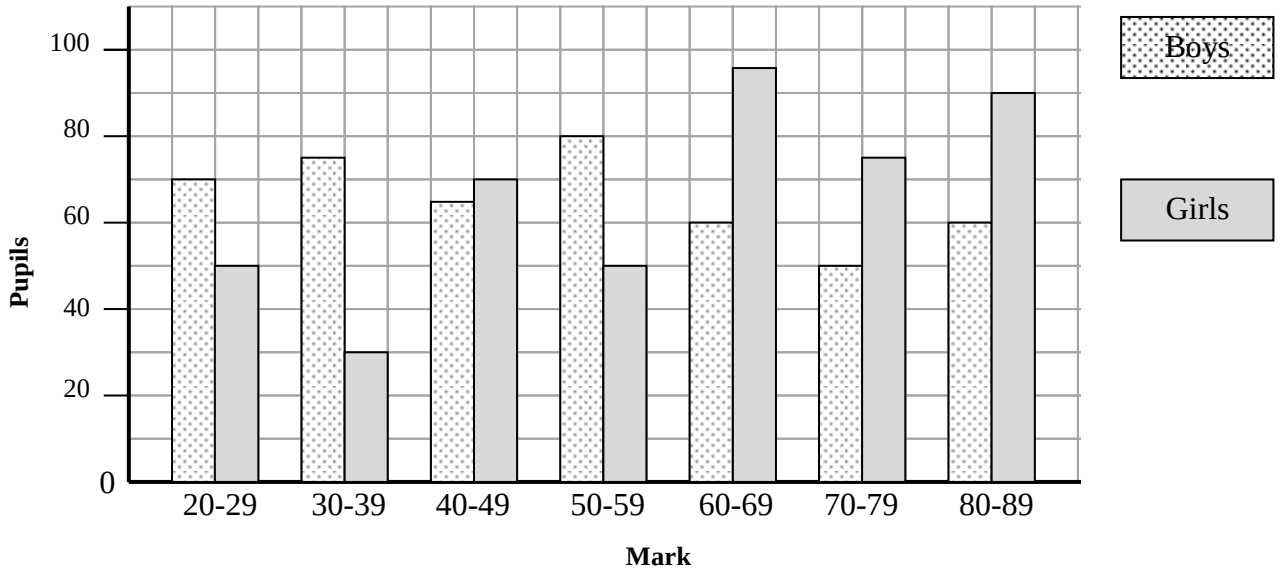
Calculate how much was donated to 'Promoting Healthy Eating'.

14. The local stationers make photocopies. The table shows the charges they make for doing this:

NO OF COPIES	BLACK & WHITE	COLOUR
UP TO 10	10p each	20p each
11-50	9p each	18p each
51-100	8p each	16p each
101-150	7p each	14p each
151-200	6p each	12p each
201-250	5p each	10p each

How much would it cost for 120 copies in colour?

15. The test marks for a year group were recorded in this compound bar graph.



(a) How many girls scored a mark between 70 – 79?

(b) Compare the marks of the boys and girls in this test.

16. Three mobile phone companies each have a contract available at the same price.

	Company A	**Company B**	**Company C**
Calls (minutes)	100	120	130
Texts	1000	750	800
Internet (Mb)	150	130	140

Laura is looking for a mobile phone contract which will give her 110 minutes of calls, 700 texts, and 140Mb of internet use.
Which company's plan would be best for her?

17. A representative for the school Government has to be chosen from Class A or Class B.
The pupil will be picked at random.

There are 30 pupils in class A and 24 in class B.
8 people in Class A want to be the rep and 6 people in Class B want to be the rep.

Which class is the representative more likely to come from?
Justify your answer by calculation.

18. In a Maths competition a team gained the following marks in each of three rounds.

Team: 14 out of 25
Speed: 22 out of 40
Relay: 42 out of 70

In which round did the team do best?
Justify your answer by calculation.

End of Question Paper

Practice Unit Assessment (3) for Numeracy **Marking Scheme**

		Response
1	Percentage calculation Addition	15% of 32 = £4.80 £36.80
2	Subtraction Division	1350 – 150 = 1200 1600/60 = 20g
3	Multiplication	550 ×1·52 = 836dollars
4	Subtraction Addition Subtraction	2 hours 55 mins 1905 1650
5	Perimeter calculation	P = 26 m #Yes, 28 m > 26 m
6	Division	105/5 = 21 miles
7	Ratio/proportion Ratio/proportion	250/5 = 50 50 × 2 = 100 # No, there were 150 children not adults
8	Difference	5 degrees
9	-	#1·5kg
10	Decimal multiplication	12·00 or 10·00 £33 or £35 #Shop A charges less
11	- -	#Length measure 6·0 cm (nearest 0·1cm) #Angle measure 70^{o} (± one degree)
12	-	# 3 of bag A and 3 of bag B £15
13	Fraction	#60/360 of 63 420 £10 570

14	-	# 120 × 14p £16.80
15	-	# 75 girls # Girls, in general, did better than the boys. Girls got higher marks than the boys
16	-	# Company C or B is most suitable
17	-	#Class A Evidence of 8/30 = 0·266 and 6/24 = 0·25 or equivalent
18	-	# Relay round Evidence of 14/25 = 0·56, 22/40 = 0·55 42/70 = 0·6 or equivalent