



for **AQA, Edexcel** and **OCR**
two-tier GCSE mathematics

Resource sheets for *Foundation Transition*

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www.smpmaths.org.uk

T6 (a) Measure the length of the line.

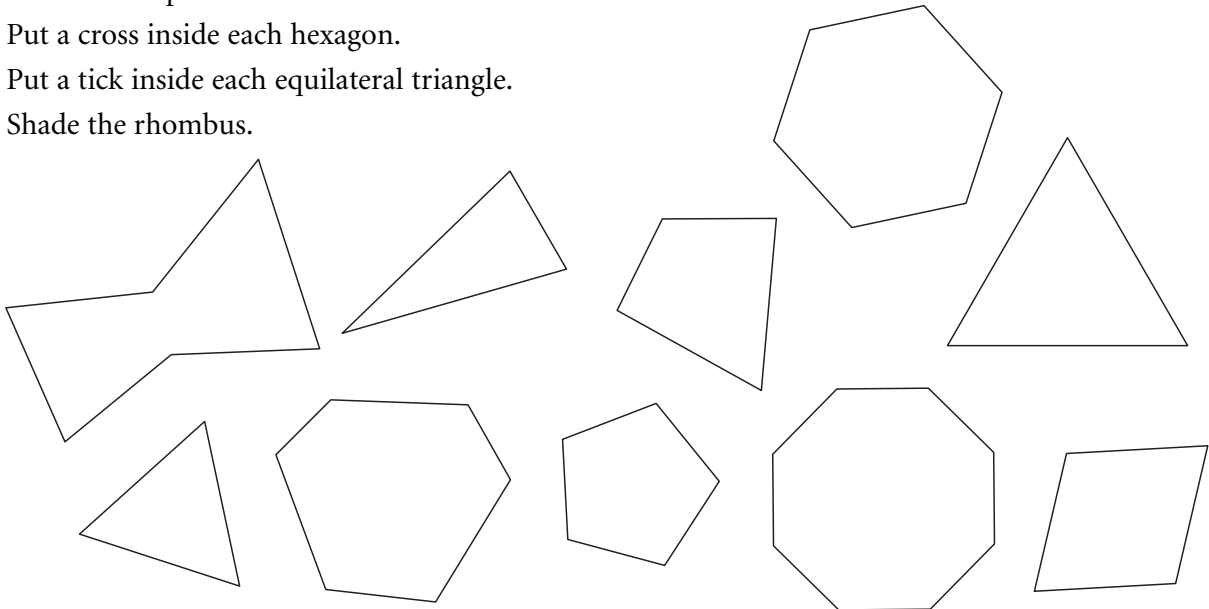


The line is to be the diameter of a circle.

- (b)** Mark the centre of this circle with a cross.
- (c)** Use a pair of compasses to draw the circle.

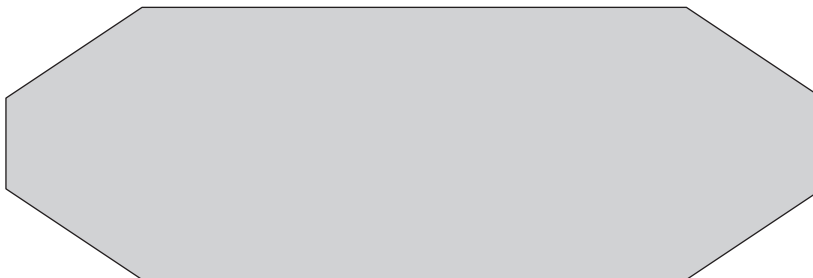
T7 Look at these shapes.

- (a)** Put a cross inside each hexagon.
- (b)** Put a tick inside each equilateral triangle.
- (c)** Shade the rhombus.



T8 (a) What is the name of the shape below? _____

- (b)** Draw all the lines of symmetry on this shape.



For each puzzle...

- Do each calculation, showing any working clearly.
- Shade in your answers on the grid on the right.
- Four of your answers should lie in a vertical, horizontal or diagonal straight line. Add up these four answers and write down this total beneath the grid.

Puzzle 1

A $31 + 64$ B $54 + 82$

C $6 + 24$ D $12 + 39$

E $23 + 92$ F $75 + 89$

G $65 + 48$ H $65 + 36$

113	146	126	101
181	111	95	115
132	30	136	51
164	75	211	134
Total			

Puzzle 2

A $65 - 42$ B $98 - 62$

C $40 - 19$ D $84 - 26$

E $50 - 41$ F $71 - 45$

G $92 - 89$ H $100 - 21$

9	7	21	76
65	92	79	33
26	23	3	94
44	72	58	36
Total			

Puzzle 3

A $46 + 382$ B $123 + 579$

C $191 - 163$ D $698 - 513$

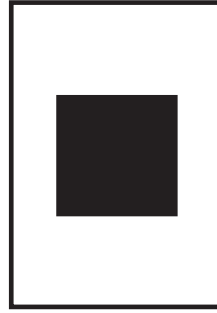
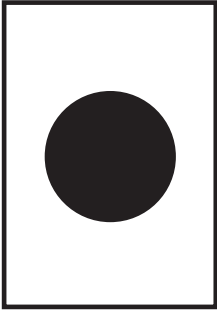
E $678 + 95$

F $532 + 781$ G $243 - 56$

H $403 - 119$




284	185	773	1313
468	175	428	2612
682	702	1243	187
1023	28	834	25
Total			

Cut out this set of cards and use them to help you find all the arrangements.



In this table, show all the arrangements of the three cards.

The first row has been done for you.

First	Second	Third
		

Cut out this set of cards and use them to help you find all the arrangements.

Tea

Cookie

Coffee

Muffin

Hot chocolate

Bagel

In this table, show all the combinations of drink and snack.

The first row has been done for you.

Drink	Snack
Tea	Muffin

$\frac{1}{3}$ of 24 $\frac{1}{2}$ of 20 $\frac{4}{5}$ of 20 $\frac{3}{4}$ of 28 $\frac{6}{7}$ of 21 $\frac{3}{4}$ of 28
 $\frac{2}{3}$ of 18 $\frac{1}{4}$ of 36 $\frac{3}{4}$ of 16 $\frac{2}{3}$ of 30 $\frac{4}{5}$ of 20 $\frac{3}{4}$ of 32
 $\frac{2}{3}$ of 30 $\frac{1}{3}$ of 33 $\frac{3}{5}$ of 15 $\frac{4}{7}$ of 14 $\frac{5}{8}$ of 24 $\frac{9}{10}$ of 20
 $\frac{1}{4}$ of 32 $\frac{3}{4}$ of 20 $\frac{2}{5}$ of 25 $\frac{2}{3}$ of 24 $\frac{1}{6}$ of 42 $\frac{2}{3}$ of 30
 $\frac{5}{6}$ of 30 $\frac{3}{4}$ of 28 $\frac{1}{4}$ of 32 $\frac{2}{5}$ of 60 $\frac{2}{3}$ of 90 $\frac{1}{8}$ of 24
 $\frac{3}{4}$ of 32 $\frac{2}{3}$ of 30 $\frac{3}{4}$ of 16 $\frac{4}{5}$ of 45 $\frac{3}{4}$ of 60 $\frac{2}{5}$ of 25
 $\frac{1}{3}$ of 24 $\frac{4}{5}$ of 20 $\frac{2}{3}$ of 30 $\frac{3}{4}$ of 32 $\frac{5}{6}$ of 30 $\frac{2}{3}$ of 30

$\frac{1}{3}$ of 24 $\frac{1}{2}$ of 20 $\frac{4}{5}$ of 20 $\frac{3}{4}$ of 28 $\frac{6}{7}$ of 21 $\frac{3}{4}$ of 28
 $\frac{2}{3}$ of 18 $\frac{1}{4}$ of 36 $\frac{3}{4}$ of 16 $\frac{2}{3}$ of 30 $\frac{4}{5}$ of 20 $\frac{3}{4}$ of 32
 $\frac{2}{3}$ of 30 $\frac{1}{3}$ of 33 $\frac{3}{5}$ of 15 $\frac{4}{7}$ of 14 $\frac{5}{8}$ of 24 $\frac{9}{10}$ of 20
 $\frac{1}{4}$ of 32 $\frac{3}{4}$ of 20 $\frac{2}{5}$ of 25 $\frac{2}{3}$ of 24 $\frac{1}{6}$ of 42 $\frac{2}{3}$ of 30
 $\frac{5}{6}$ of 30 $\frac{3}{4}$ of 28 $\frac{1}{4}$ of 32 $\frac{2}{5}$ of 60 $\frac{2}{3}$ of 90 $\frac{1}{8}$ of 24
 $\frac{3}{4}$ of 32 $\frac{2}{3}$ of 30 $\frac{3}{4}$ of 16 $\frac{4}{5}$ of 45 $\frac{3}{4}$ of 60 $\frac{2}{5}$ of 25
 $\frac{1}{3}$ of 24 $\frac{4}{5}$ of 20 $\frac{2}{3}$ of 30 $\frac{3}{4}$ of 32 $\frac{5}{6}$ of 30 $\frac{2}{3}$ of 30

of 15 = 5	$\frac{1}{4}$	of 16 = 4	$\frac{2}{5}$	of 24 = 8	$\frac{1}{6}$
of 40 = 4	$\frac{4}{5}$	of 12 = 3	$\frac{3}{4}$	of 18 = 9	$\frac{1}{3}$
of 20 = 12	$\frac{2}{3}$	of 10 = 4	$\frac{1}{3}$	of 18 = 3	$\frac{3}{5}$
of 20 = 4	$\frac{1}{4}$	of 24 = 18	$\frac{1}{10}$	of 20 = 15	$\frac{2}{3}$
of 10 = 8	$\frac{1}{2}$	of 18 = 12	$\frac{3}{4}$	of 9 = 6	$\frac{1}{5}$



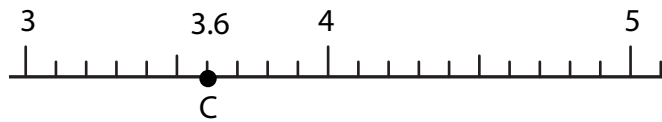
of 15 = 5	$\frac{1}{4}$	of 16 = 4	$\frac{2}{5}$	of 24 = 8	$\frac{1}{6}$
of 40 = 4	$\frac{4}{5}$	of 12 = 3	$\frac{3}{4}$	of 18 = 9	$\frac{1}{3}$
of 20 = 12	$\frac{2}{3}$	of 10 = 4	$\frac{1}{3}$	of 18 = 3	$\frac{3}{5}$
of 20 = 4	$\frac{1}{4}$	of 24 = 18	$\frac{1}{10}$	of 20 = 15	$\frac{2}{3}$
of 10 = 8	$\frac{1}{2}$	of 18 = 12	$\frac{3}{4}$	of 9 = 6	$\frac{1}{5}$

For each card • mark the position of the number on the number line
 • write its letter beneath its mark

Each set of letters should spell a word.

(a) The first number and letter have been marked on the line for you.

3.6	3.8	4.9	3.1	4.5	4	3.4
C	A	N	D	O	G	E



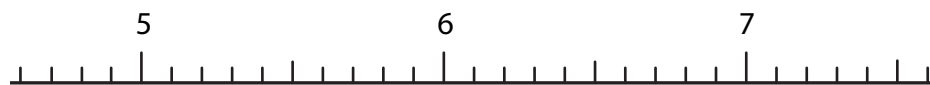
(b)

9.7	10.2	8.6	9.1	11.3	8.0	10.9
A	M	Y	R	D	P	I



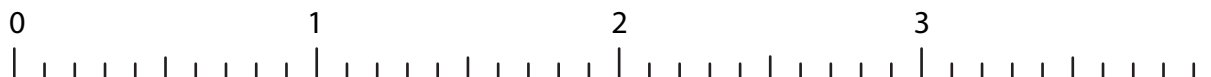
(c)

5.1	6.3	5.8	6.9	7.3	4.9
E	G	I	H	T	H



(d)

1.5	0.7	2.6	0.3	1.9	3.0	0.1	3.6
I	L	D	Y	N	E	C	R

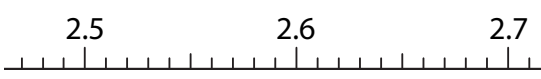


In each puzzle • write the decimals in order in the top row of the boxes
 • beneath each number write its letter

Each set of letters should spell a word.
 Number lines are shown to help you.

(a) The first number and letter have been put in the correct places for you.

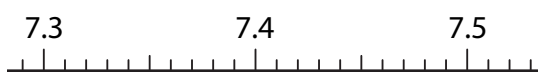
2.68	2.58	2.7	2.63	2.6	2.51	2.71
M	E	A	I	C	D	L



2.51						
D						

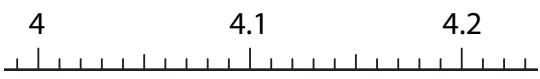
(b)

7.43	7.4	7.34	7.5	7.39	7.52
A	U	S	R	Q	E




(c)

4.18	4.23	4.1	4.2	4.02	4.12
I	S	A	U	R	D



(d)

0.21	0.16	0.1	0.3	0.29	0.03
O	B	U	D	I	C



In each puzzle • write the decimals in order in the top row of the boxes
 • beneath each number write its letter

Each set of letters should spell a word.

(a) The first number and letter have been put in the correct places for you.

2.41	2.37	2.28	2.34
N	A	M	E

2.28			
M			

(b)

1.29	1.3	1.2	1.16	1.1
S	M	I	R	P

(c)

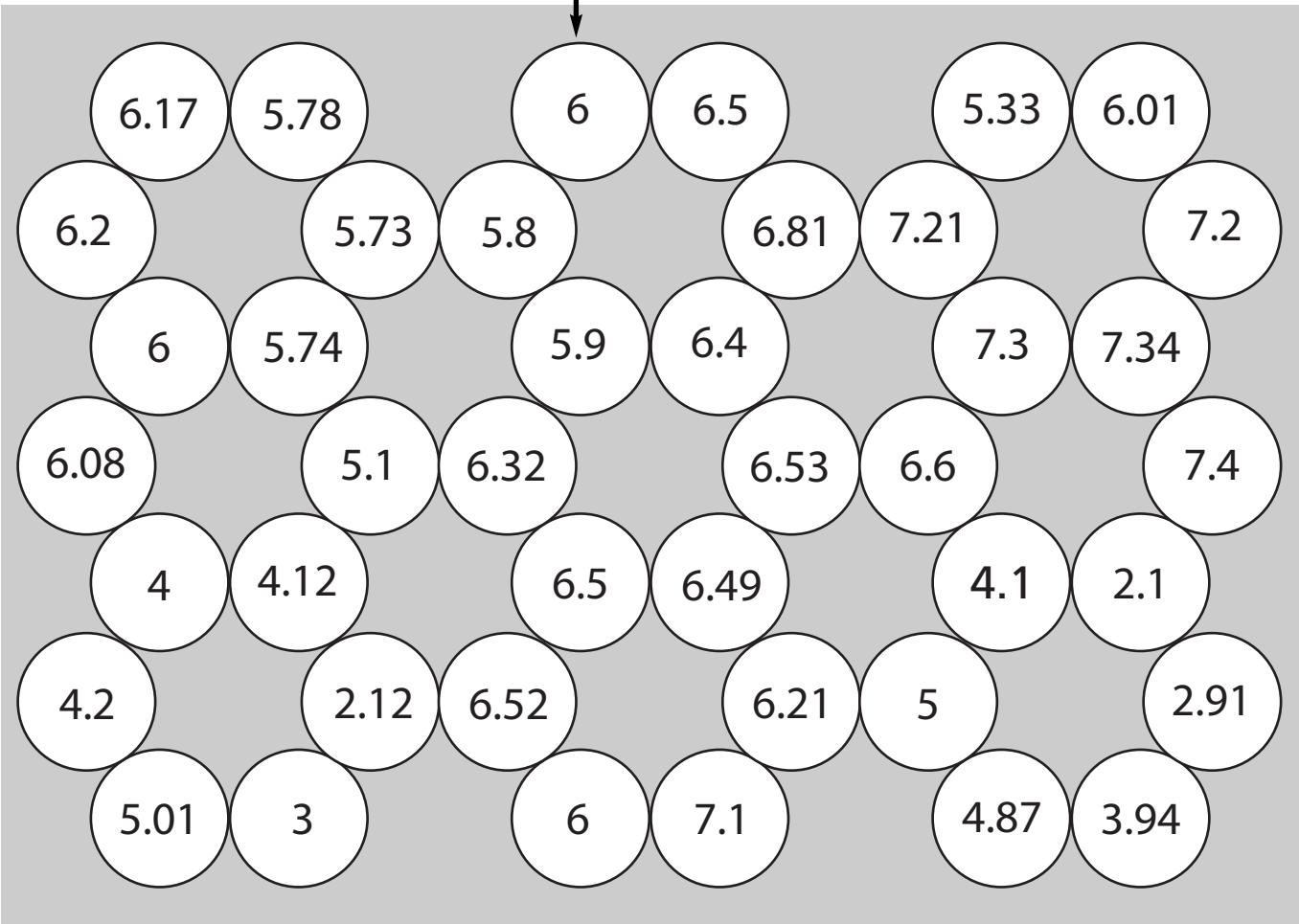
5.1	5.09	5.14	4.97	5
L	G	E	A	N

(d)

0.27	0.13	0.2	0.02	0.1
E	N	G	R	A

Closest neighbour maze

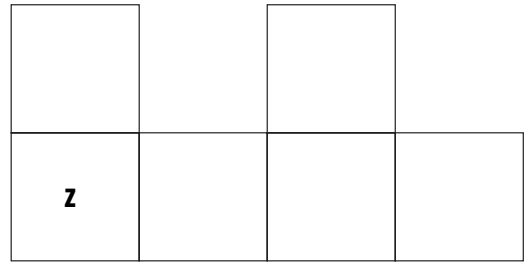
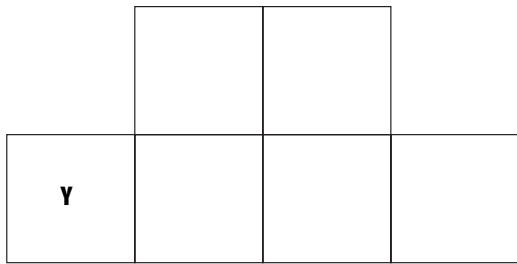
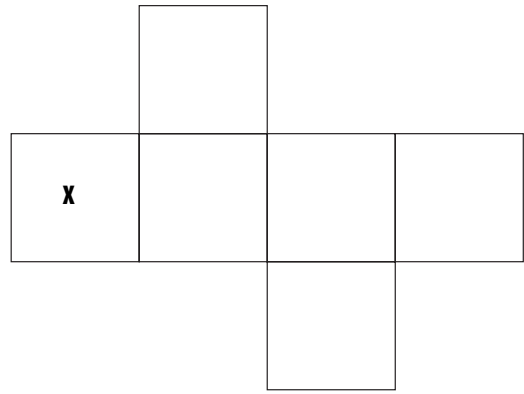
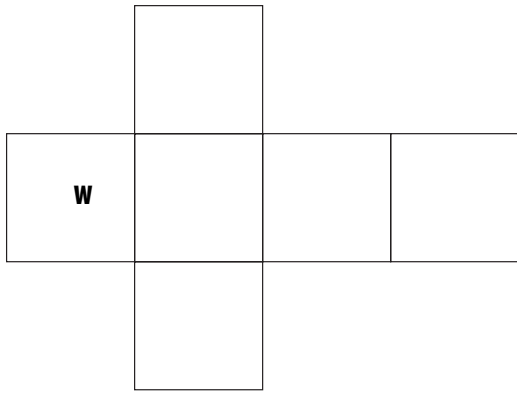
Start



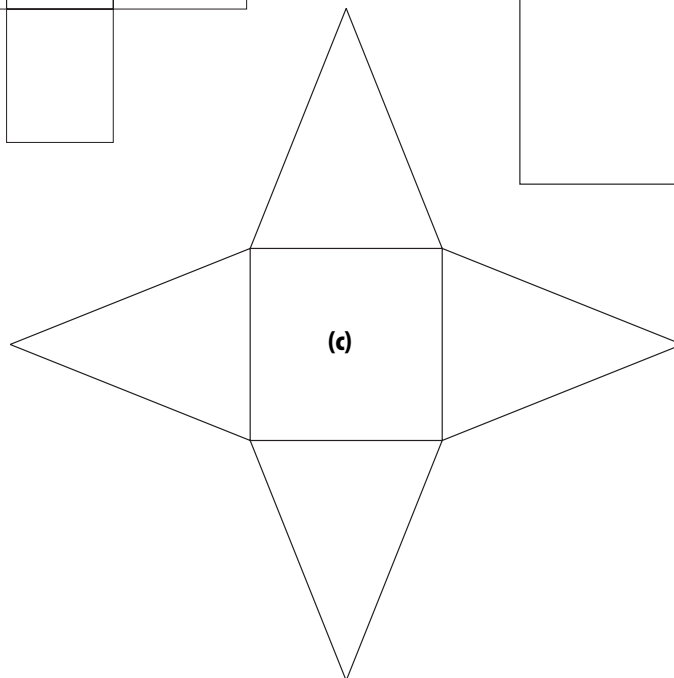
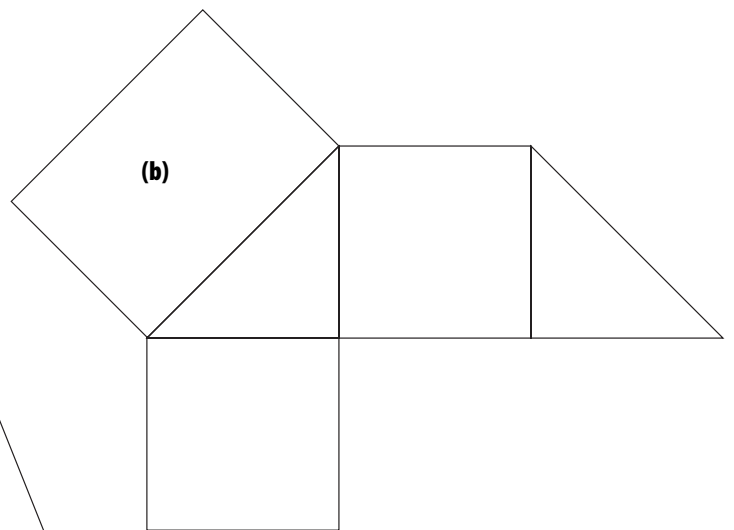
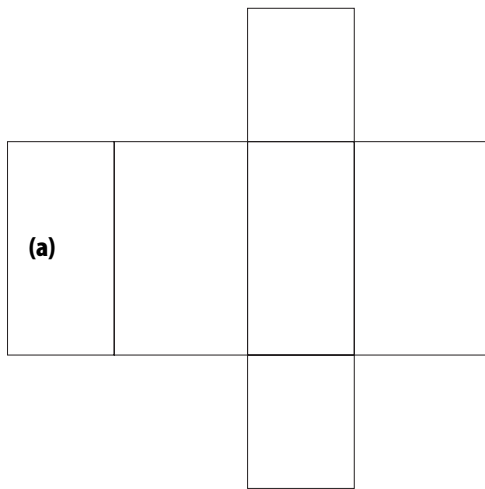
- Start in the circle at the top marked '6'.
Shade this circle.
- Move to the neighbouring circle that has the number closest to the number you are on.
Shade this circle.
- Without visiting the same circle twice, continue until you can't go any further.

What number do you finish on?

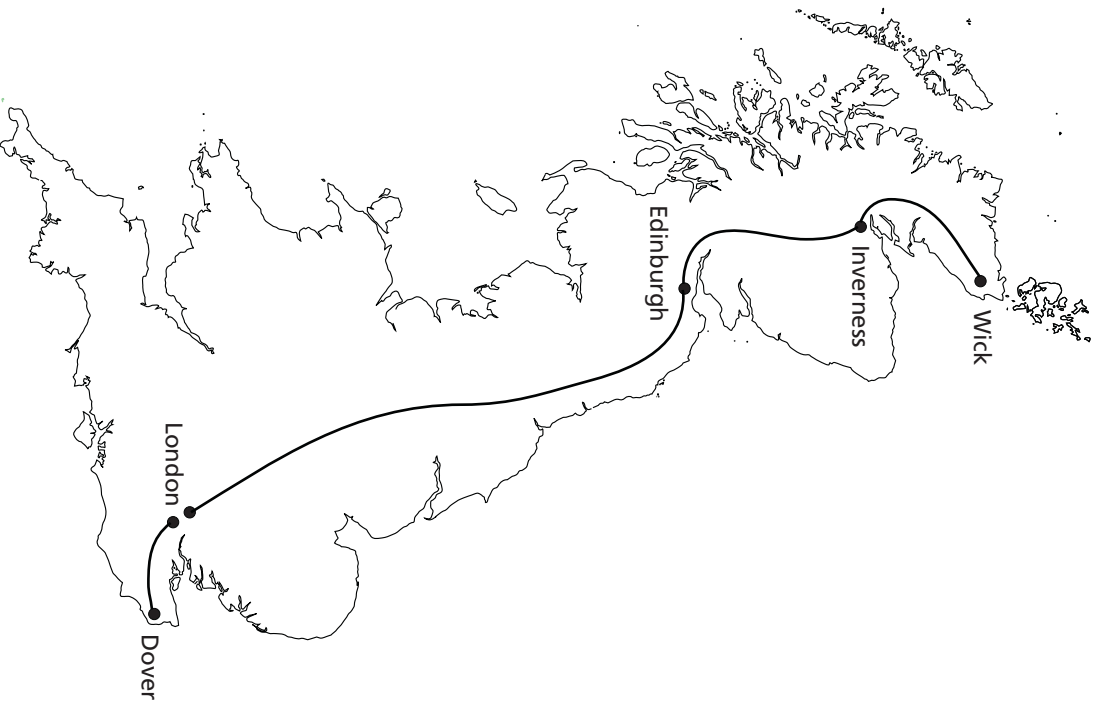
A2



A3



Railroded



Timetables

Wick	0629	1209	1617
Inverness	1023	1600	2007

Inverness	0755	1040	1245	1440
Perth	0954	1248	1446	1652
Edinburgh	1123	1403	1559	1814

Edinburgh	1230	1300	1330	1400	1500	1600	1700	1730	1900
Newcastle	1354	1424	1452	1529	1624	1729	1834	1901	2031
York	1450	1528	1553	1628	1725	1826	1937	1959	2136
London (Kings Cross)	1653	1741	1802	1831	1923	2042	2145	2217	0003

You need to allow one hour to go from Kings Cross to Victoria.

London (Victoria)	1955	2005	2105	2205
Dover	2150	2159	2300	2347

Delays

Roll the dice for each part of the journey.

- Score 6 and your train arrives 10 minutes early.
- Score 5 and your train arrives on time.
- Score 1 and your train arrives 10 minutes late.
- Score 2 and your train arrives 20 minutes late.
- Score 3 and your train arrives 30 minutes late.
- Score 4 and your train arrives 40 minutes late.

Departing from	Departure time	Expected to arrive	Delay	Actual arrival
Wick				
Inverness				
Edinburgh				
London (Kings Cross)				
London (Victoria)				
Dover				

Departing from	Departure time	Expected to arrive	Delay	Actual arrival
Wick				
Inverness				
Edinburgh				
London (Kings Cross)				
London (Victoria)				
Dover				

For each puzzle...

- Do each calculation, showing any working clearly.
- Shade in your answers on the grid on the right.
- Four of your answers should lie in a vertical, horizontal or diagonal straight line.
Add up these four answers and write down this total beneath the grid.
(You will need to line up the numbers very carefully!)

Puzzle 1

A $3.4 + 9.6$ B $1.23 + 3.94$

C $3.5 + 2.3$ D $1.9 + 2.61$

E $5 + 1.3$

F $6.52 + 10.3$ G $3.75 + 9.86$

H $6.9 + 0.7$

13.61	7.2	5.32	5.17
5.8	11	2.36	13
6	4.51	6.3	16.82
4.63	5.9	16.79	7.6
Total			

Puzzle 2

A $5.3 - 2$ B $6.29 - 1.17$

C $8.65 - 3.46$ D $4.13 - 2.86$

E $6.8 - 0.2$

F $5.98 - 2.3$ G $7.25 - 3.4$

G $9.08 - 5.6$

4.25	5.12	4.3	4.91
3.68	3.3	3.58	5.6
1.38	5.19	1.27	6.6
3.1	3.48	2.61	3.85
Total			

Puzzle 3

A $6.23 + 3.77$ B $1.23 + 0.05$

C $8.9 - 3.12$ D $12.3 + 9.86$

E $11.3 - 4.09$

F $16.3 - 0.15$ G $5 - 3.2$

H $6 - 1.53$

1.28	12	1.5	10
6.31	5.78	1.8	3.62
22.16	16.15	7.21	4.42
5.43	9.3	16.2	4.47
Total			

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88
89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104
105	106	107	108	109	110	111	112

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88
89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104
105	106	107	108	109	110	111	112

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88
89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104
105	106	107	108	109	110	111	112

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88
89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104
105	106	107	108	109	110	111	112

1									
2	3								
4	5	6							
7	8	9	10						
11	12	13	14	15					
16	17	18	19	20	21				
22	23	24	25	26	27	28			
29	30	31	32	33	34	35	36		
37	38	39	40	41	42	43	44	45	
46	47	48	49	50	51	52	53	54	55

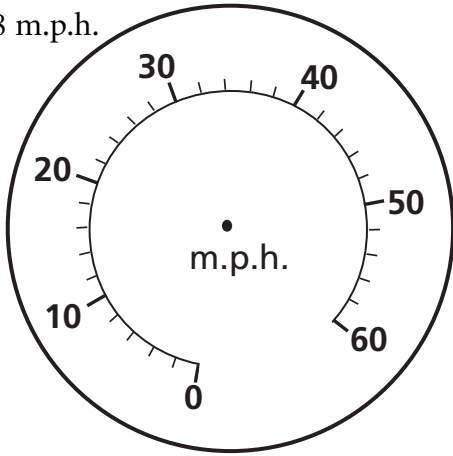
1									
2	3								
4	5	6							
7	8	9	10						
11	12	13	14	15					
16	17	18	19	20	21				
22	23	24	25	26	27	28			
29	30	31	32	33	34	35	36		
37	38	39	40	41	42	43	44	45	
46	47	48	49	50	51	52	53	54	55

1									
2	3								
4	5	6							
7	8	9	10						
11	12	13	14	15					
16	17	18	19	20	21				
22	23	24	25	26	27	28			
29	30	31	32	33	34	35	36		
37	38	39	40	41	42	43	44	45	
46	47	48	49	50	51	52	53	54	55

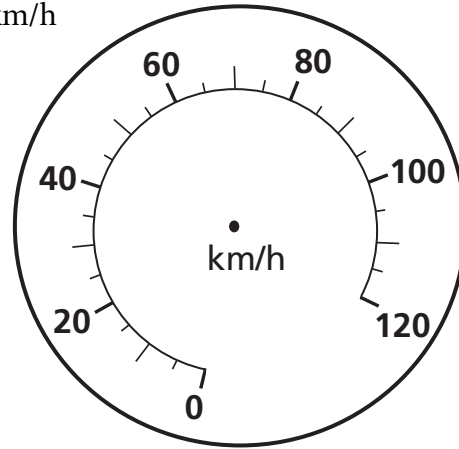
1									
2	3								
4	5	6							
7	8	9	10						
11	12	13	14	15					
16	17	18	19	20	21				
22	23	24	25	26	27	28			
29	30	31	32	33	34	35	36		
37	38	39	40	41	42	43	44	45	
46	47	48	49	50	51	52	53	54	55

Draw an arrow on each of these scales to show the reading given.

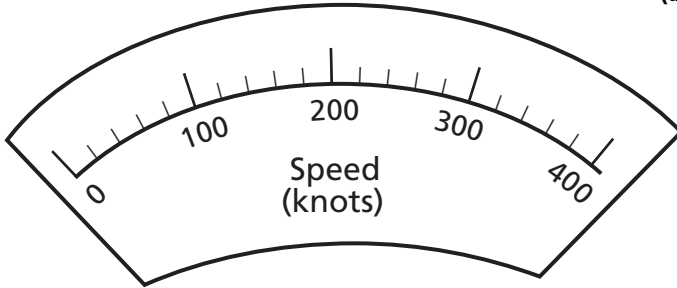
A (a) 48 m.p.h.



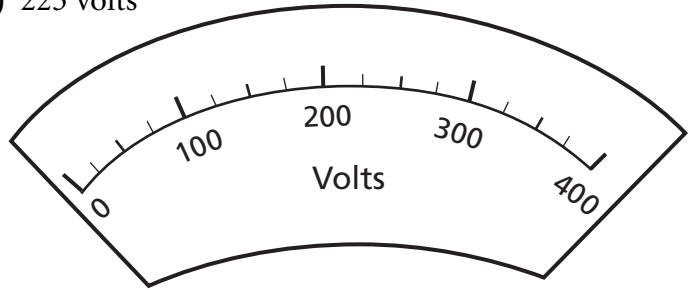
(b) 105 km/h



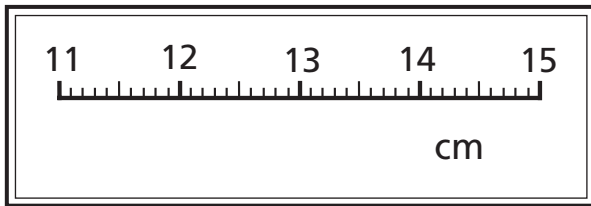
(c) 160 knots



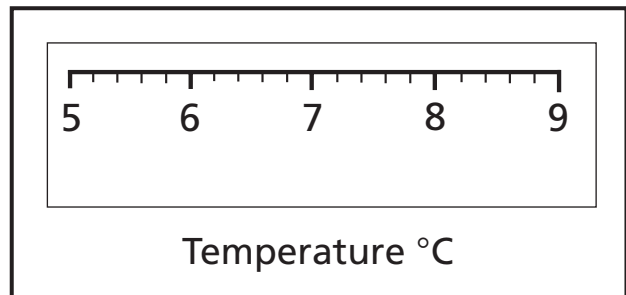
(d) 225 volts



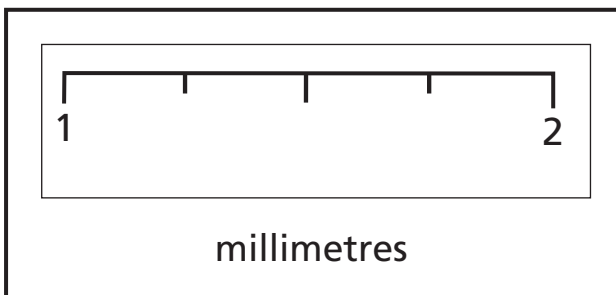
B (a) 13.6 cm



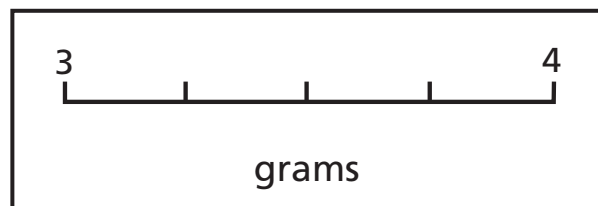
(b) 8.4 °C



(c) 1.5 mm

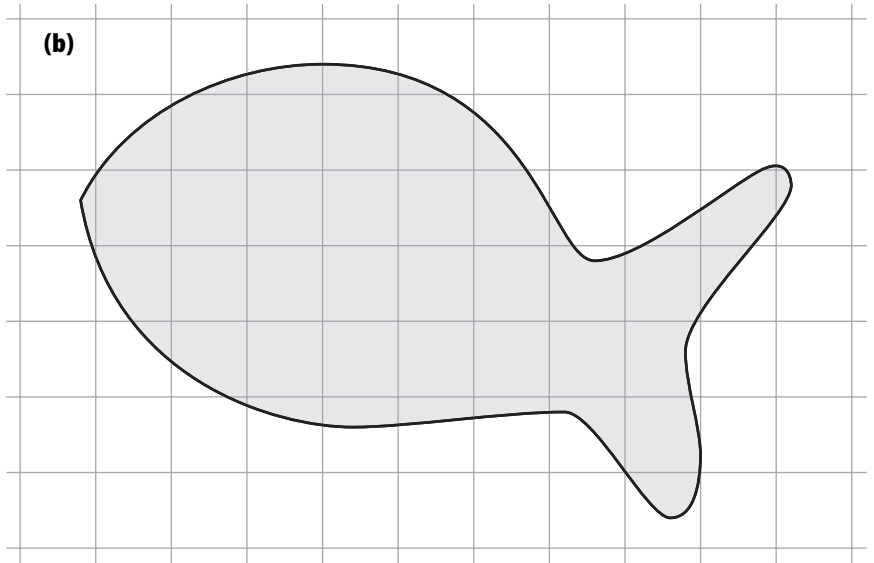
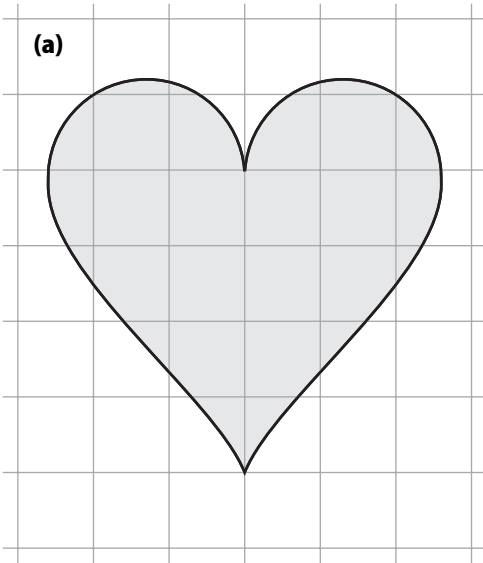


(d) 3.75 g



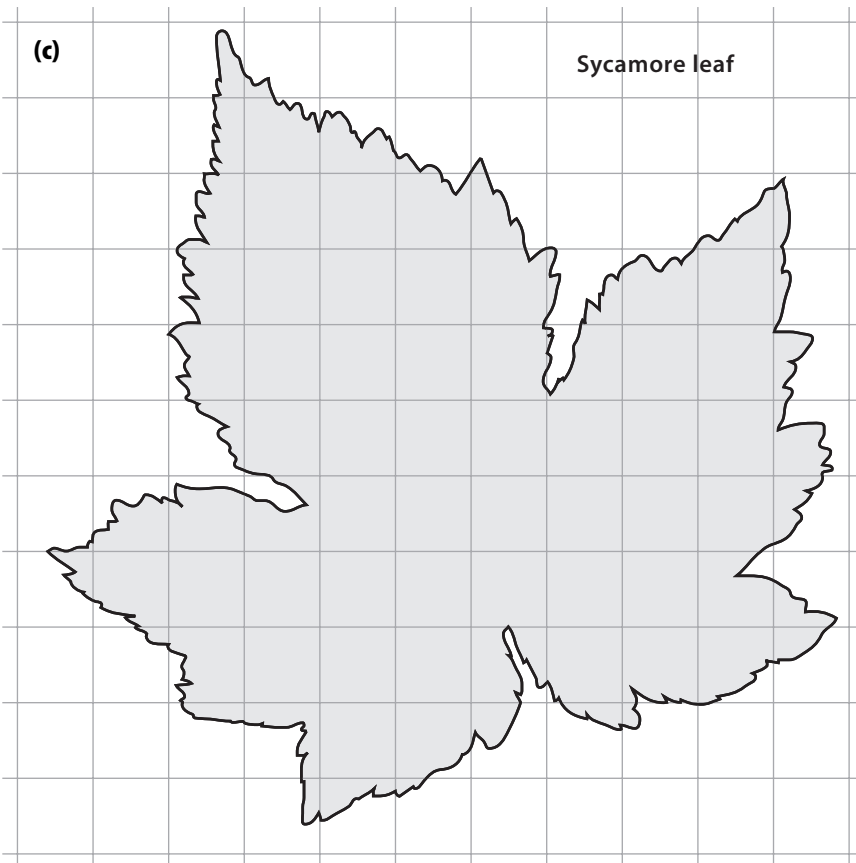
Write 1 in each square that you will count as a whole square.

Write $\frac{1}{2}$ where you will count a half square.



Estimated total area
 = ___ full squares + ___ half squares
 = ___ cm^2 + ___ cm^2
 = ___ cm^2

Estimated total area
 = ___ full squares + ___ half squares
 = ___ cm^2 + ___ cm^2
 = ___ cm^2



Estimated total area
 = ___ full squares + ___ half squares
 = ___ cm^2 + ___ cm^2
 = ___ cm^2

The equation game for 2 players**You need**

- About 12 counters each (a different colour for each player)
- The game board below
- A set of game cards (sheet FT-20)

Before you start

- Shuffle the cards and lay them face down in one pile.

When it is your turn

- Take the top card and solve the equation.
- Cover its solution on the board with one of your counters.
- You only solve one equation on your turn.
- Only one counter is allowed on each square.

The winner

- The winner is the first player to cover four numbers in a row (across, down or diagonally).

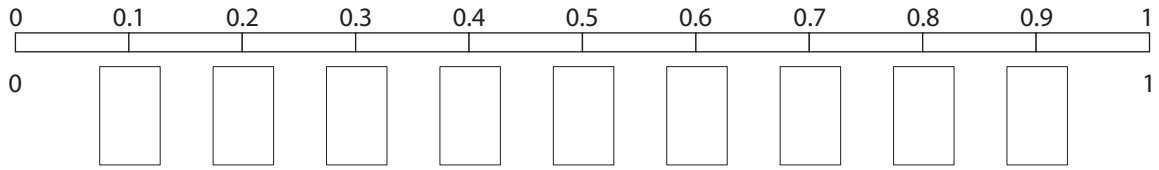
6	4	2	5	6
5	12	3	8	4
2	3	6	3	2
4	8	3	12	5
6	5	2	4	6

$n + 3 = 8$	$80 \div n = 10$	$n + 18 = 22$	$22 - n = 19$	$8n = 24$
$n - 5 = 1$	$30 \div n = 6$	$2n = 8$	$n \div 2 = 2$	$n \times 7 = 14$
$30 - n = 28$	$n - 1 = 2$	$n \div 3 = 2$	$2n = 24$	$5n = 10$
$16 \div n = 2$	$1 + n = 7$	$n \times 3 = 18$	$9n = 18$	$36 \div n = 9$
$15 + n = 18$	$2 \times n = 10$	$n + 8 = 20$	$n - 3 = 2$	$4 \times n = 24$

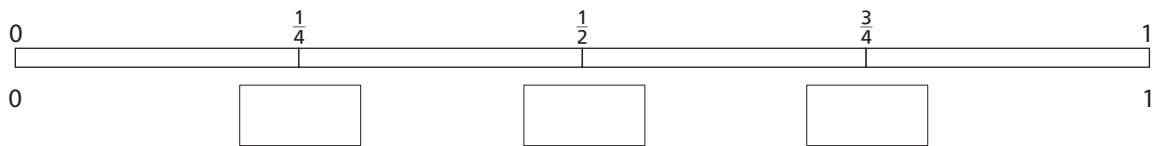
18	3	10	2	6
8	9	6	7	4
13	4	7	5	12
7	5	8	3	9
14	6	11	1	15

$5n + 3$	$3(n + 2)$	$4n - 7$	$2(n + 2)$	$3(n + 1)$
$3(n - 1)$	$2(n + 1)$	$n + 4$	$2n - 1$	$n + 5$
$2(n - 1)$	$\frac{n + 13}{2}$	$n + 3$	$n + 9$	$\frac{n + 7}{2}$
$\frac{n}{2} + 4$	$\frac{n}{3} + 5$	$n - 1$	$\frac{n}{2} + 2$	$n - 2$
$\frac{n + 3}{2}$	$\frac{n + 7}{3}$	$\frac{n + 2}{2}$	$\frac{n + 1}{2}$	$\frac{n - 1}{2}$

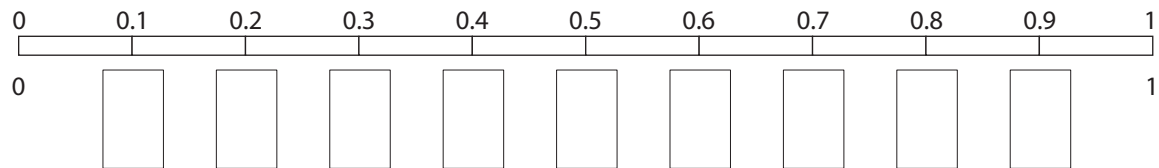
Write the fractions in the boxes.



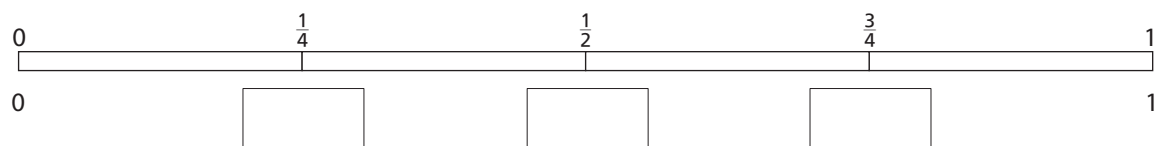
Write the decimals in the boxes.



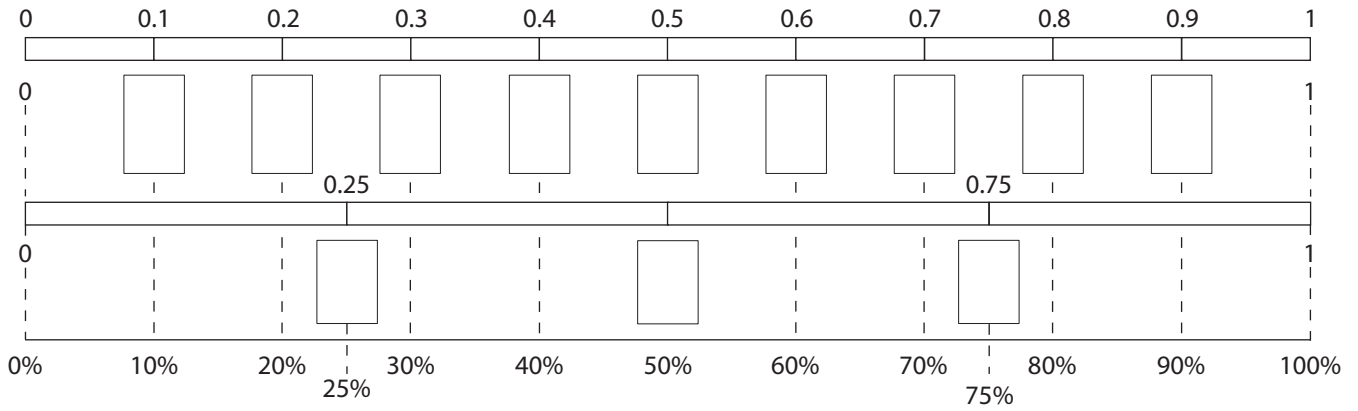
Write the fractions in the boxes.



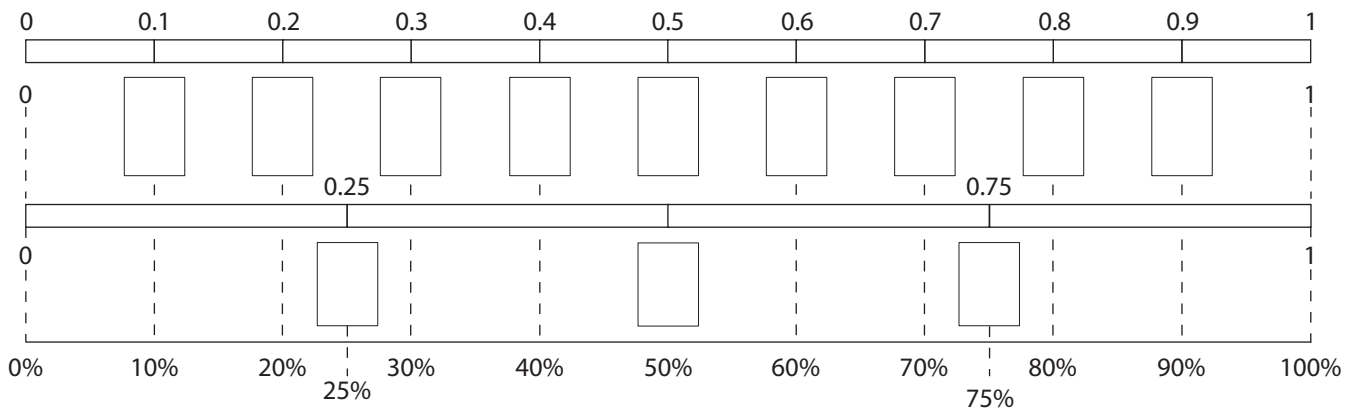
Write the decimals in the boxes.

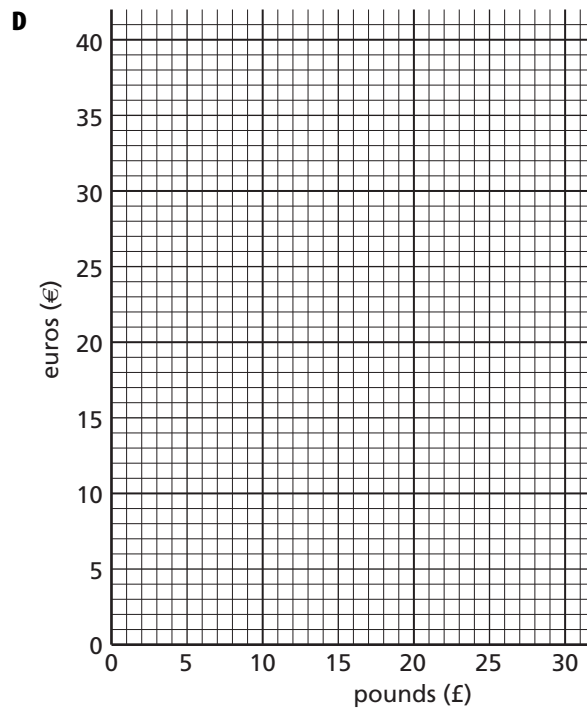
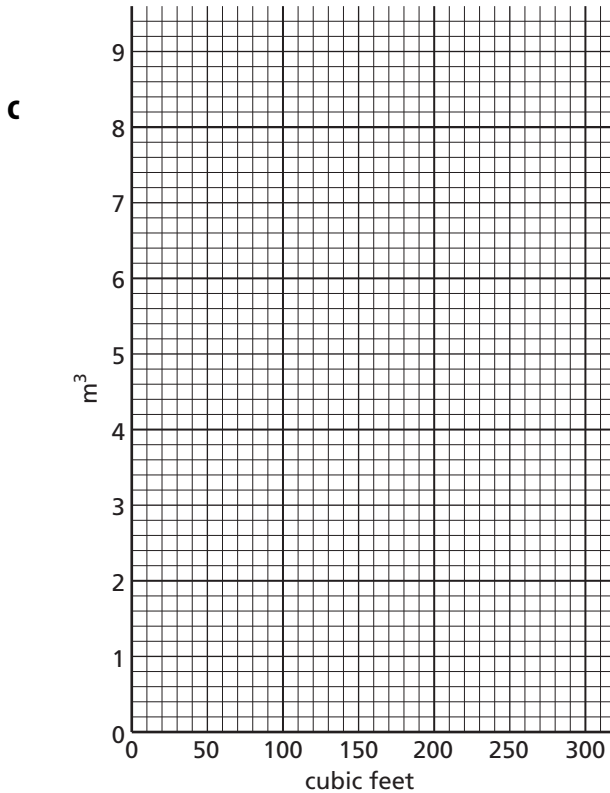
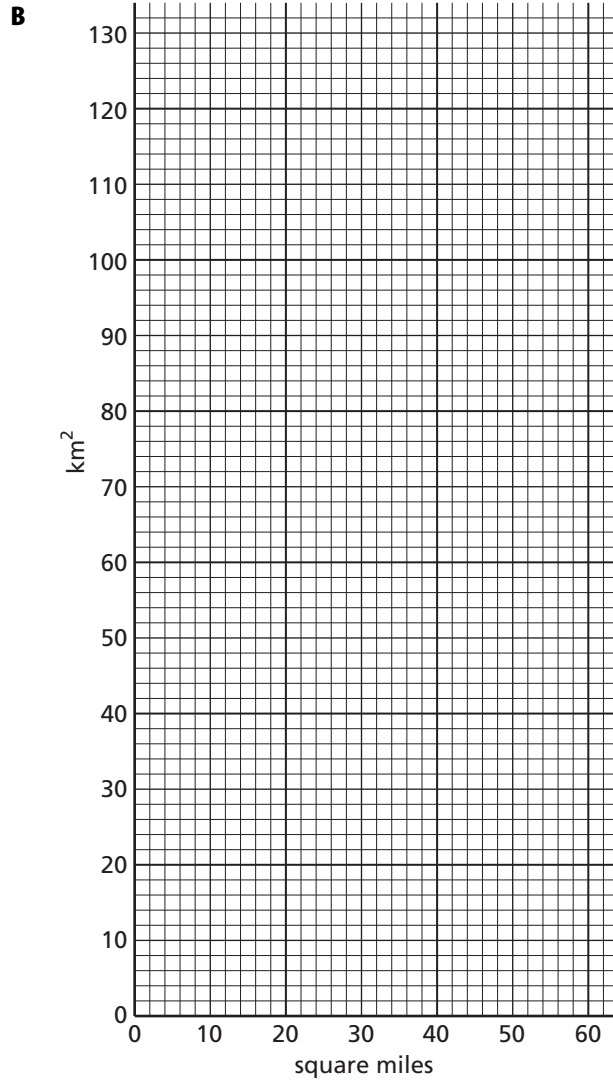
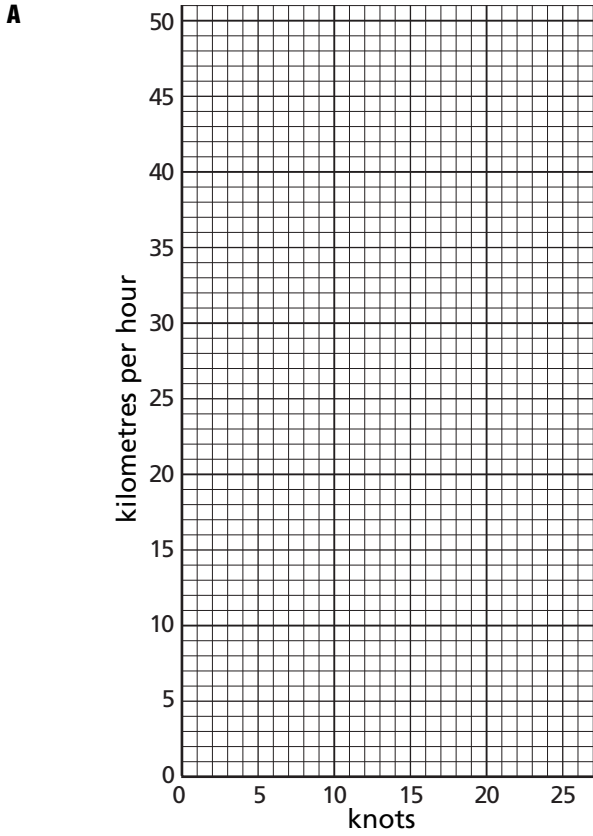


Write the fractions in the boxes.

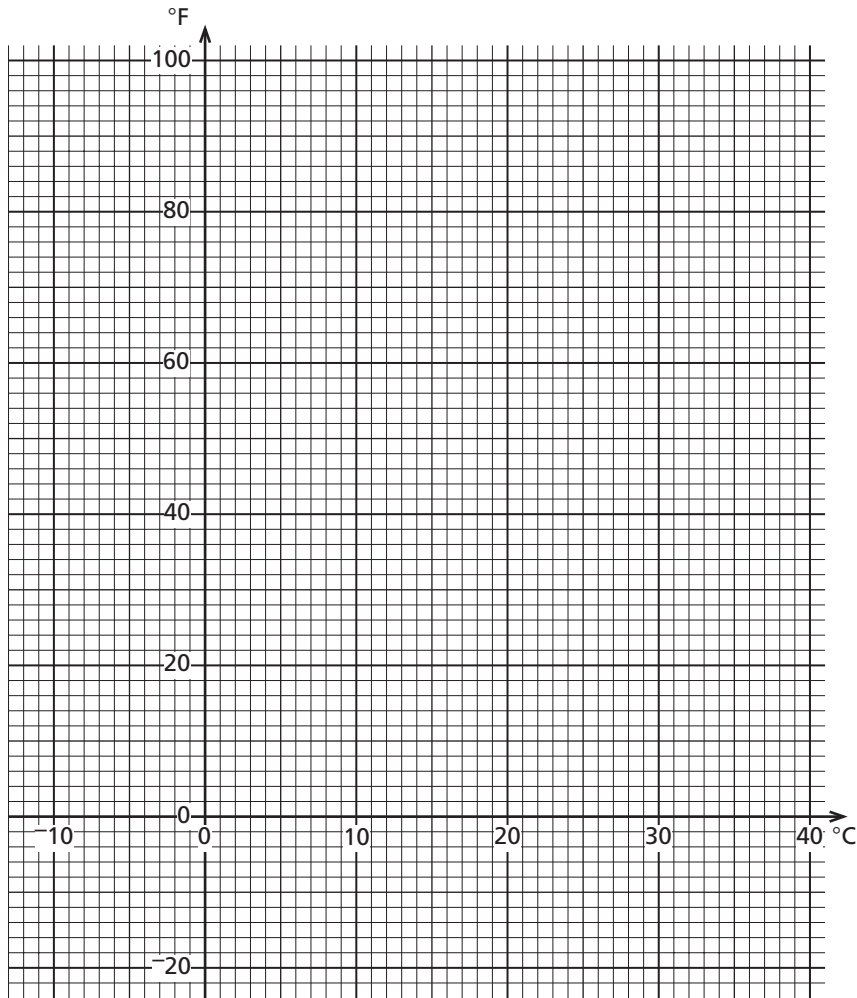


Write the fractions in the boxes.





A



B

