HAZELWOOD
INTEGRATED COLLEGE

Year 8
Mathematics
Knowledge Organiser

Name: _____

Class: _____

Year 8 Maths checklist

Questions	What I will be able to master?	Done
1-4	Read and write whole numbers in words and figures	
5	Multiply, and divide, any whole number by 10, 100 and 1000	
6-8	Round whole numbers to the nearest 1000, 100 or 10	
9-10	Put a set of numbers in ascending or descending order	
11-15	Mentally add and subtract numbers	
16-17	Solve addition and subtraction problems using bar models	
18-22	Addition and Subtraction	
23	Use estimation to find approximate answers	
24-26	Understand, calculate and work with perimeters	
27-30	Use bar models to represent problems	
31-34	Understand decimal notation and place values	
35	Convert between decimal and fraction when denominator is a factor of 10 or 100	
36-40	Use the number line to display decimals and round to the nearest whole number or to 1 or 2 decimal places	
41-45	Order a set of positive integers and decimals	
46-48	Multiply and divide any integer or decimal by 10,100 and 1000	
49-54	Addition and subtraction of integers and decimals	
55-56	Calculate the perimeter of rectangles, squares and triangles	
57-59	Solve word problems involving the addition and subtraction of money	

Year 8 Maths checklist

Questions	What I will be able to master?	Done
60	Use multiplication and division facts to solve mental calculations	
61-66	Understand the terms factor, HCF, multiple and LCM	
67-68 , 72	Estimate answers in calculations	
69-70	Use the grid method to multiply	
71	Divide by an integer	
73	Use fact families to answer multiplication questions	
74-80	Calculate the areas of rectangles, triangles and parallelograms	
81-83	Multiply whole numbers and decimals	
84-87	Estimate answers in calculations and check that results are reasonable	
88-89	Solve area problems	
90-100	Calculate the areas of rectangles, triangles and compound shapes with decimals	
101	Find the mean average	
102-103	Word problems suing multiplication and division	
104-114	Estimate and measure length, mass and volume	
115	Estimate the size of any angle	
116-118	Draw and measure acute and obtuse angles	
119	Angles on a straight line and angles at a point	
120-121	Classify triangles according to their properties	

Year 8 Maths checklist

Questions	What I will be able to master?	Done
122-123	Construct triangles	
124-127	Sum of interior angles in a triangle	
128	Classify quadrilaterals according to their properties	
129	Construct quadrilaterals	
130	Sum of interior angles in a quadrilateral	
131-133	Identify lines of symmetry on a shape	
134	Tessellations	
135-138	Recognise and name equivalent fractions	
140	Convert between mixed numbers and improper fractions	
143-147	Convert simple fractions to decimals and percentages	
144-154	Find a fraction of an amount	
155-157	Multiply fractions	
158-160	Divide fractions	
161-164	Order of operations	

1) Put the following numbers in the place value table.

a) 2415
b) 607
c) 9380
d) 2004

1000 Thousands	100 Hundreds	10 Tens	1 Ones

2) Write the following numbers in figures.

a) six hundred and sixty seven _____
b) two thousand one hundred and fifty six _____
c) nine hundred and fourteen _____
d) four thousand and seventy one _____

3) Write the following numbers in words.

a) 5432 _____
b) 811 _____
c) 3620 _____
d) 9090 _____

4) a) What is the value of the 2 in the number 1250?

b) What is the value of the 6 in the number 6924?

5

a) $75 \times 100 = \_\_\_\_$

b) $102 \times 10 = \_\_\_\_$

c) $9 \times 1000 = \_\_\_\_$

d) $450 \div 10 = \_\_\_\_$

e) $3800 \div 10 = \_\_\_\_$

f) $9700 \div 100 = \_\_\_\_$

g) $60 \times 1000 = \_\_\_\_\_$

h) $7000 \div 100 = \_\_\_\_$

i) $210 \times 1000 = \_\_\_\_\_$

j) $1050000 \div 1000 = \_\_\_\_$

Rounding to the Nearest 10, 100, etc

6 Round these numbers to the nearest 10:

a) 26

b) 62

c) 75

d) 231

e) 797

f) 5842

g) 9875

h) 13758

7 Round these numbers to the nearest 100:

a) 78

b) 223

c) 549

d) 1450

e) 1382

f) 4537

g) 9193

h) 17625

8 Round these numbers to the nearest 1000:

a) 850

b) 1455

c) 3230

d) 7500

e) 8455

f) 9690

g) 12390

h) 28910

9 Arrange in order from smallest to largest (ASCENDING)

(a) 8, 5, 9, 10, 2

(b) 11, 20, 9, 15, 14, 3

(c) 40, 60, 20, 30, 90, 10

(d) 83, 18, 45, 37, 90, 21

(e) 140, 180, 210, 70, 300

(f) 605, 56, 566, 655, 506, 65, 555

(g) 2000, 375, 7100, 2900, 999, 400

10 Place the correct sign, < or >, between the following pairs of numbers

(a) 3 ☐ 1

(b) 2 ☐ 7

(c) 10 ☐ 11

(d) 8 ☐ 5

(e) 33 ☐ 25

(f) 28 ☐ 21

(g) 102 ☐ 99

(h) 110 ☐ 113

11 Fill in the empty boxes in each calculation:

7 + 6 = ☐

☐ + 12 = 33

13 + ☐ = 20

☐ + ☐ + ☐ = 20

12 Fill in the gaps in the calculations below:

5 + 3 = ...

7 + 6 = ...

75 + ... = 100

..... + 3 = 18

8 + 6 = ...

..... + 61 = 100

5 + ... = 18

..... + 6 = 15

55 + ... = 100

15 + 13 = ...

11 + 6 = ...

33 + ... = 100

13 Fill in the empty boxes in each calculation:

$13 - 8 = \square$

$26 - \square = 15$

$20 - \square = \square$

$36 - \square - \square = 7$

14 Fill in the gaps in the calculations below:

9 – 5 = ...

..... – 5 = 14

19 – ..... = 4

29 – 15 = ...

7 – 3 = ...

8 – 3 = ...

..... – 3 = 6

29 – 3 = ...

100 – 20 = ...

100 – 63 = ...

100 – ..... = 55

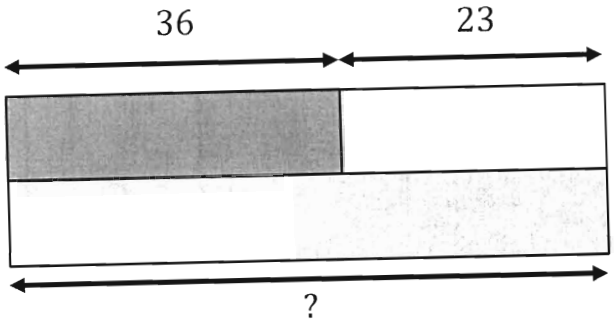
100 – ..... = 11

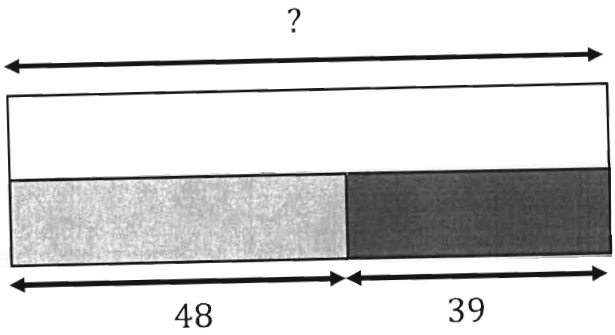
15 Fill in the gaps in these addition grids.

+	7	9	
4	11		
		17	
	13		11

+			13
16	22		
			21
	7	18	

16 Label these bar models and complete the fact families.





36 + 23 = ...

..... + 36 = ...

..... – 23 = 36

..... – ..... = 23

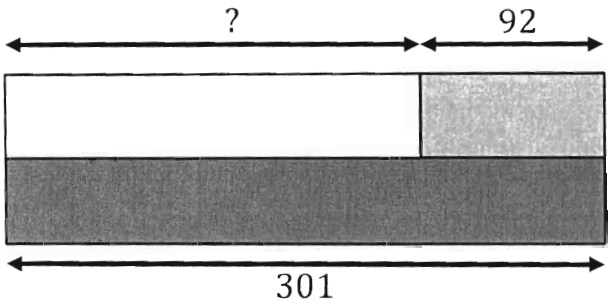
48 + ... = ...

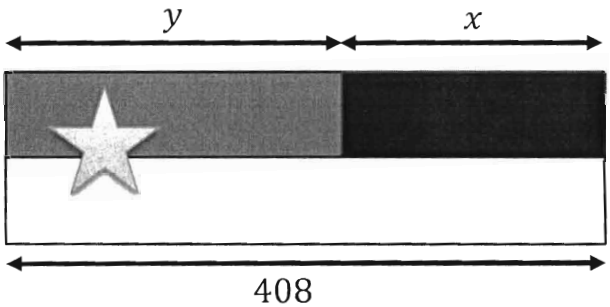
..... + ... = ...

..... – ..... = 39

..... – 39 = ...

17 Complete these bar models and write down the fact family for each one.





18

652 + 58	91 + 689	92 + 510	79 + 802
773 + 33	833 + 27	136 + 15	31 + 289
97 + 431	95 + 518	53 + 181	27 + 160

19

Find the missing digits below (there may be more than one solution):

$$\begin{array}{r} \square\ 2\ 4 \\ +\ 1\ \square\ 3 \\ \hline 4\ 5\ \square \\ \hline \end{array}$$

$$\begin{array}{r} \square\ \square\ 1 \\ +\ \square\ 8\ \square \\ \hline 1\ 6\ 0\ 0 \\ \hline \end{array}$$

$$\begin{array}{r} 4\ \square\ 7 \\ +\ 7\ \square\ \square \\ \hline 1\ \square\ 1\ 6 \\ \hline \end{array}$$

20

505 - 322	627 - 535	867 - 663	833 - 123
845 - 344	406 - 127	511 - 167	878 - 232
657 - 321	402 - 338	299 - 206	977 - 123

21

Find the missing digits below (there may be more than one solution):

□ 2 4 - 1 □ 3 6 2 □	□ □ 1 - 3 8 □ 4 2 0	1 4 □ 7 - 1 □ 7 □ □ 3 □ 9

22 Using the numbered cards below:

25	17	22	34	48	11	19

a) Select two numbers with a difference of 14

.....

b) Select two numbers with a difference of 8

.....

c) Select two numbers with a sum of 33 and a difference of 11

.....

23 . We can use estimation to obtain approximate answers to questions.
e.g. $234 + 107 \approx 200 + 100 = 300$

Estimate the answers to the following calculations:

a) $234 + 107 \approx$ .....

b) $382 + 89 \approx$ .....

c) $404 + 326 \approx$ .....

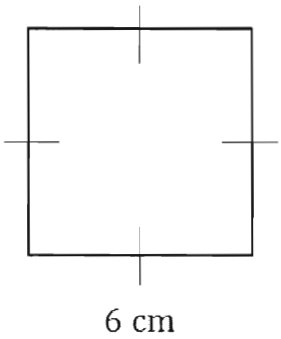
d) $188 - 34 \approx$ .....

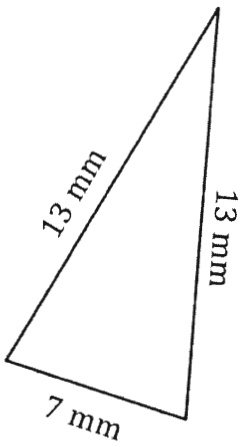
e) $7024 - 481 \approx$ .....

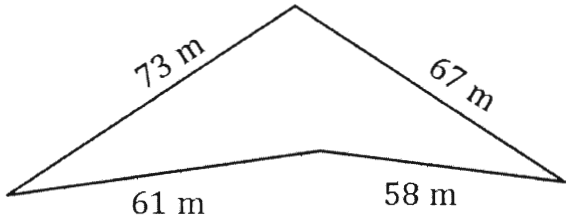
24 **Problems with addition and subtraction**

Calculate the perimeters of the following shapes:

Diagrams not drawn accurately



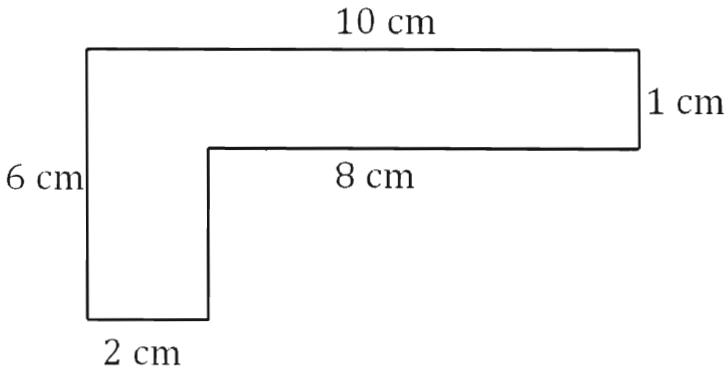




....

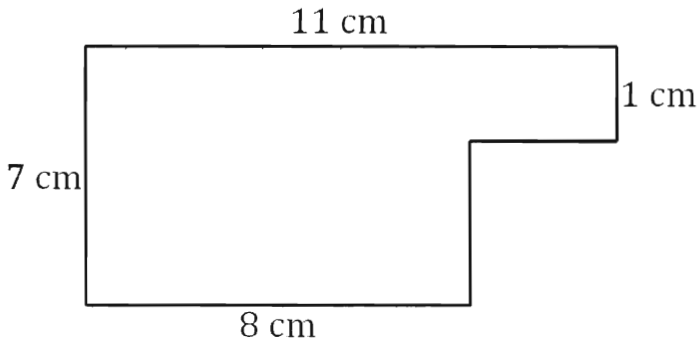
25 Find the length of the missing sides and then calculate the perimeter of the following shapes:

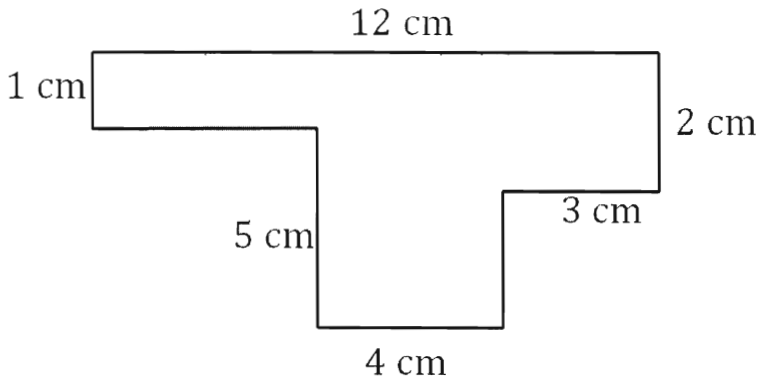
Diagrams not drawn accurately



Perimeter = ...

Perimeter = ...



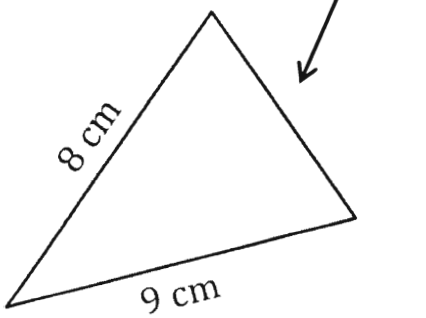


Perimeter = ...

26 You are given the perimeter of each shape. Calculate the length of each labelled side:

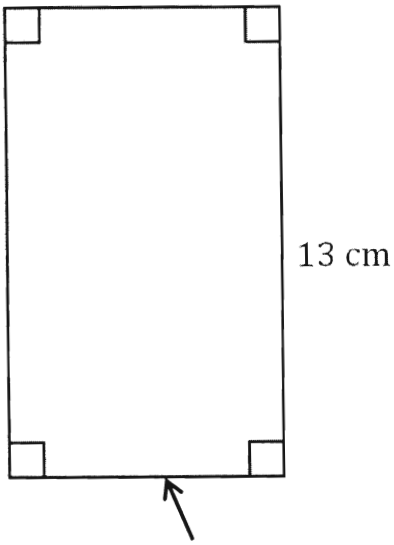
Diagrams not drawn accurately

Perimeter = 24 cm



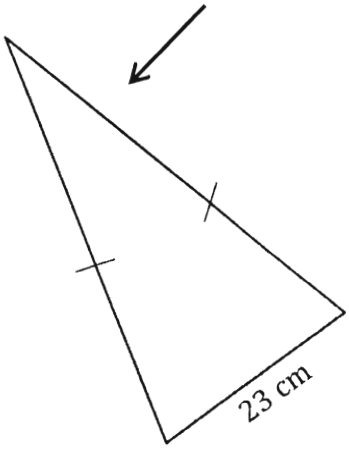
.....

Perimeter = 46 cm



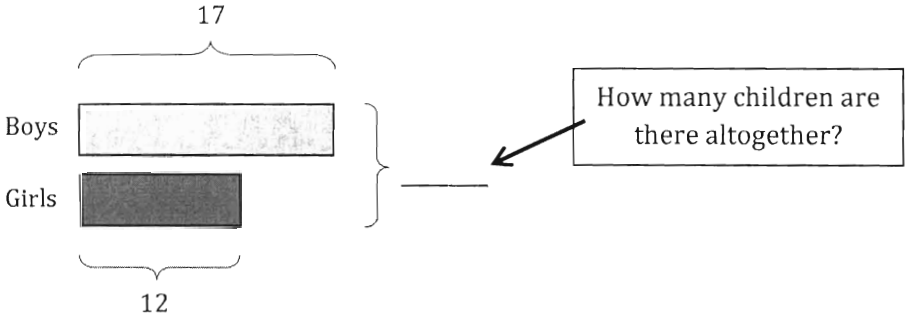
.....

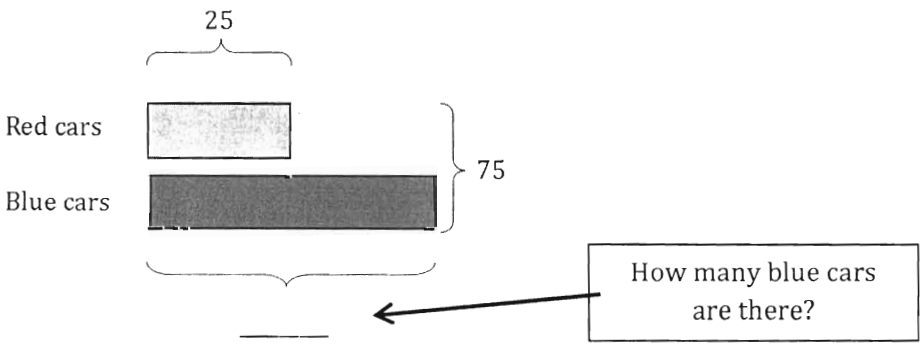
Perimeter = 93 cm



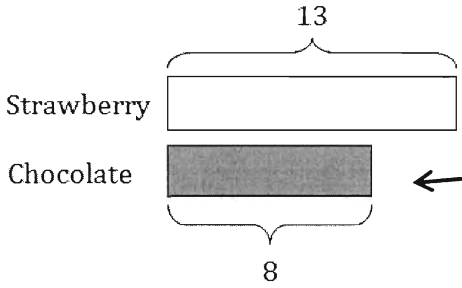
.....

27 Use the bar models below to answer the questions in the boxes:



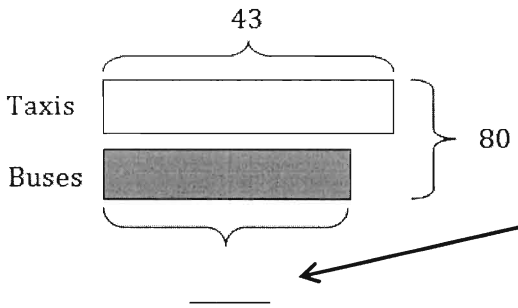


28 Use the bar models below to answer the following questions:



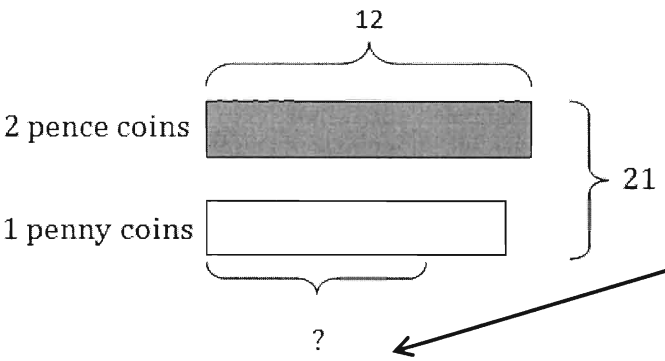
How many **more** strawberry cupcakes are there than chocolate cupcakes?

.....



How many buses were there?

.....



How many one penny coins are there?

.....

What **value** of money is this altogether?

.....

29 Helen and Ali each have some building blocks. Ali has 23 more blocks than Helen.

Draw a bar model to represent this problem.

If Ali has 48 blocks, how many does Helen have?

How many blocks do they have altogether?

30. There are 42 girls and 21 boys in a queue for a roller coaster.
14 girls leave the queue.
How many more girls than boys are left?

31 **Concept Corner**

A decimal point is used to separate the whole number part from the fractional part of a number.

Tens	Ones	Tenths	Hundredths
2	9	5	2

The number above in words is .....

.....

Write the number forty point three seven in the empty row.

32 Fill in the spaces in the statements below:

37.092

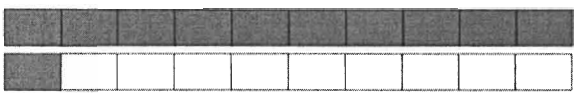
a) The digit in the thousandths place is .....

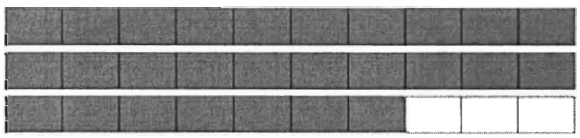
b) The digit in the ones place is .....

c) The digit in the tenths place is .....

33 If  represents 1, what do each of the following represent?

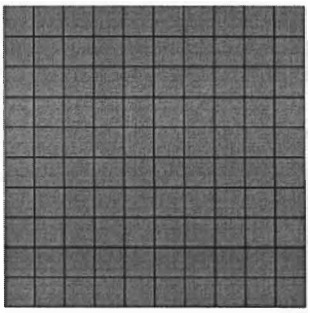
a)  = ...

b)  = ...

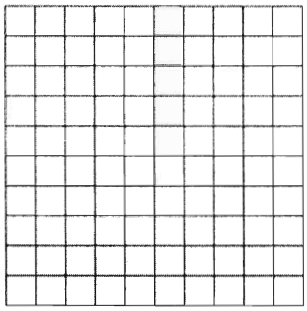
c)  = ...

34 a) The fully shaded large square below represents 1. Shade the correct part of the other two squares:

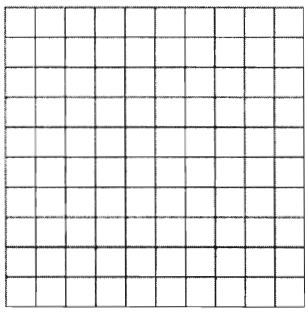
1



0.07

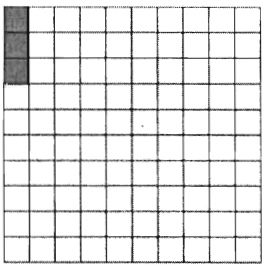


0.85



b) Explain why these answers are incorrect:

0.3



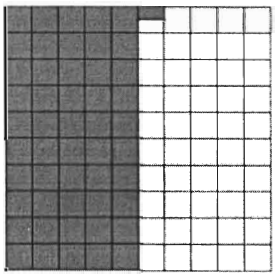
This is **incorrect** because:

.....

.....

.....

0.55



This is **incorrect** because:

.....

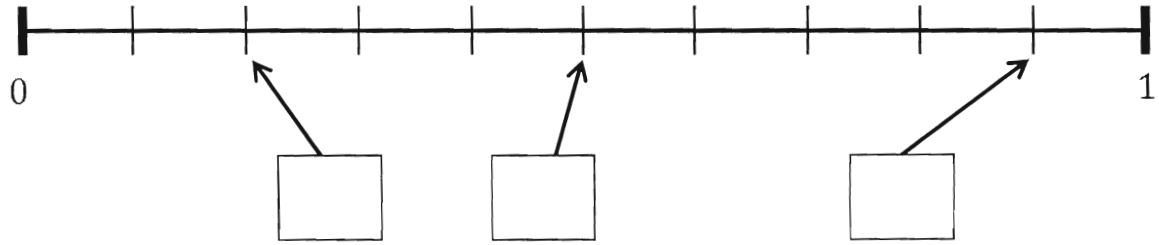
.....

.....

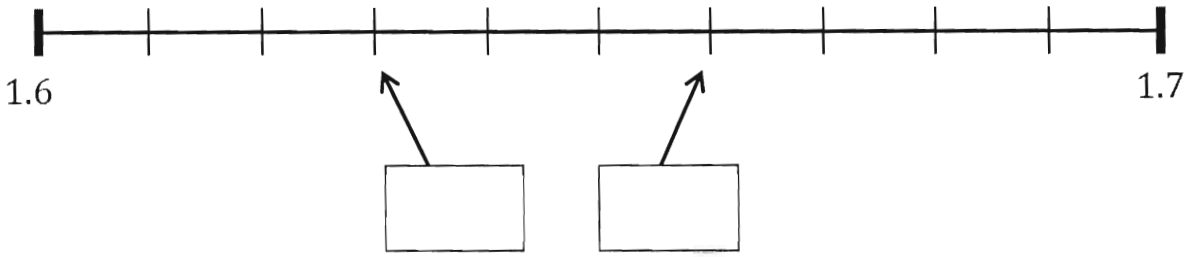
35 Draw a line matching each decimal to the correct fraction:

0.71	$\frac{71}{10}$
0.071	$\frac{71}{100}$
7.1	$\frac{71}{1000}$
0.701	$\frac{701}{1000}$

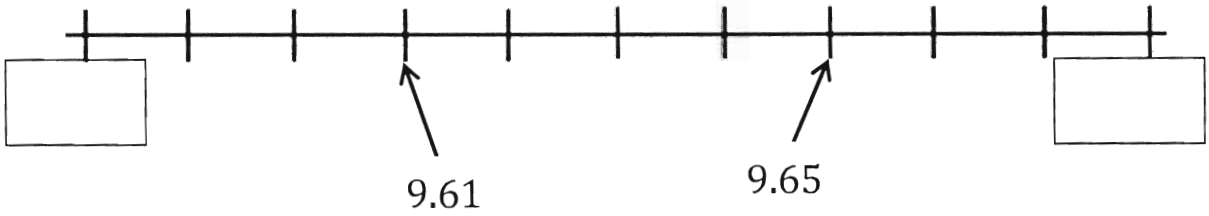
36 a) This number line is from 0 to 1. Each space represents 0.1. Fill in the empty boxes:



b) This number line is from 1.6 to 1.7. Each space represents 0.01. Fill in the empty boxes:



c) Fill in the missing values on these number lines:



Rounding to Decimal Places

37 Round the following numbers to 1 decimal place

a) 13.681 b) 344.7234 c) 0.76133

38 Round the following numbers to 2 decimal places

a) 58.8136 b) 14.22731 c) 203.86884

39 Round the following numbers to 1 decimal place

a) 48.9732 b) 163.9299 c) 19.952

40 Round the following numbers to 2 decimal places

a) 10.697 b) 8.993 c) 14.9964

Ordering Decimals

41 Put these amounts of money in order, starting with the smallest:

a) £4.50, £3.82, £4.05, £3.99, £3.54

b) £1.25, £2.41, £1.24, £2.04, £1.99

c) £15.83, £24.18, £13.99, £46.01, £46.10

42 Circle the smallest number: 0.1, 0.09, 0.99, 0.15, 0.11

43 Put these numbers in order, starting with the smallest:

2.01, 2.45, 2.14, 2.006, 2.405

44 Put these numbers in order, starting with the smallest:

0.76, 0.668, 0.608, 0.099, 0.909

45 Put these numbers in order, starting with the smallest:

5.004, 4.889, 4.099, 5.002, 4.095

46 Answer the following questions:

a) $37 \times 10 =$ .....

b) $5900 \div 100 =$ .....

c) $4.9 \times 10 =$ .....

d) $7.03 \div 10 =$ .....

e) $0.45 \times 1000 =$ .....

f) $34.8 \div 100 =$ .....

g) $10 \times 4.7 \div 100 =$ .....

47 Fill in the gaps to make the following statements correct:

a) $570 \times$ ..... $= 57\,000$

b) $0.86 = 86 \div$ .....

c) ..... $\times 0.037 = 3.7$

d) $3020 \div$ ..... $= 3.02$

e) ..... $\div 100 = 0.4507$

48 Circle the correct word to show whether the following statements are true or false:

i) $870 \div 100 = 87$ TRUE/FALSE

ii) $5.03 \div 10 = 0.53$ TRUE/FALSE

iii) $0.59 \times 100 = 59$ TRUE/FALSE

iv) $0.01 \times 100 = 0.0100$ TRUE/FALSE

v) $6001 \div 1000 = 6.001$ TRUE/FALSE

49 **a** Add 3.4 and 5.8. **b** Total 5.38 and 3.92. **c** Add 14.5 and 21.56.

$$\begin{array}{r} 3.4 \\ +\ 5.8 \\ \hline \ldots.2 \\ \hline \end{array}$$

$$\begin{array}{r} 5.38 \\ +\ 3.92 \\ \hline \ldots.0 \\ \hline \end{array}$$

$$\begin{array}{r} 21.56 \\ +\ 14.50 \\ \hline \ldots\ldots.\ldots\ldots \\ \hline \end{array}$$

Work out the answers.

5.6 + 2.8

$$\begin{array}{r} 5.6 \\ +\ 2.8 \\ \hline . \\ \hline \end{array}$$

4.68 + 2.37

$$\begin{array}{r} 4.68 \\ +\ 2.37 \\ \hline . \\ \hline \end{array}$$

34.5 + 23.85

$$\begin{array}{r} 34.5 \\ +\ 23.85 \\ \hline . \\ \hline \end{array}$$

4.6 + 5.92

47.37 + 25.8

6.84 + 48.5

50 **a** Work out the total of 24.6 and 52.73.

b) What is 3.46 + 12.7 + 5.08?

51 Work out the answers.

a 7.8 − 4.5

$$\begin{array}{r} 7.8 \\ -\ 4.5 \\ \hline \ldots.3 \\ \hline \end{array}$$

b 37.72 − 15.56

$$\begin{array}{r} 37.7\,{}^{1}2 \\ -\ 15.56 \\ \hline \ldots\ldots.\ldots6 \\ \hline \end{array}$$

c 7.3 − 5.18

$$\begin{array}{r} 7.3\,{}^{1}0 \\ -\ 5.18 \\ \hline \ldots\ldots.\ldots\ldots \\ \hline \end{array}$$

52 Work out these decimal subtractions.

a 21.6 − 15.4

b 45.19 − 23.81

c 34.27 − 19.47

d 56.8 − 25.37

e 72.6 − 26.45

f 62.34 − 37.9

53 **a** How much more than 27.3 is 76.19?

b What is the difference between 56.28 and 83.7?

You should know

In mathematics find the **difference** by subtracting.

c What is 5.67 + 14.93 − 8.6?

Hint

Do the addition first, then the subtraction.

54 Find the pairs of numbers that add to 10.

2.75	6.5	6.8	7.3
0.75	3.65	3.15	4.5
3.2	2.7	7.25	9.25
6.85	5.5	6.35	3.5

..... + ... = 10

..... + ... = 10

..... + ... = 10

..... + ... = 10

..... + ... = 10

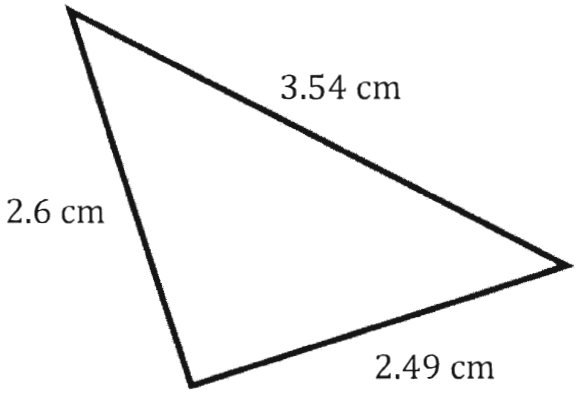
..... + ... = 10

..... + ... = 10

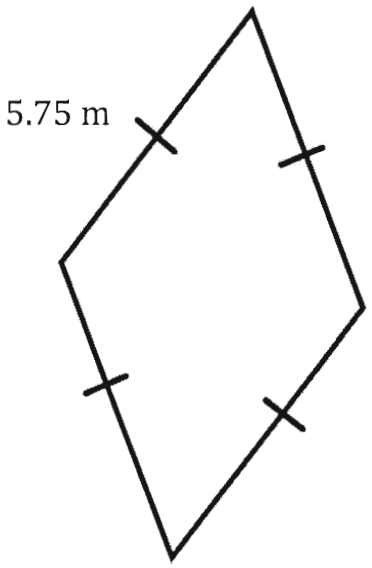
..... + ... = 10

55 Calculate the perimeters of these shapes:

Not drawn accurately



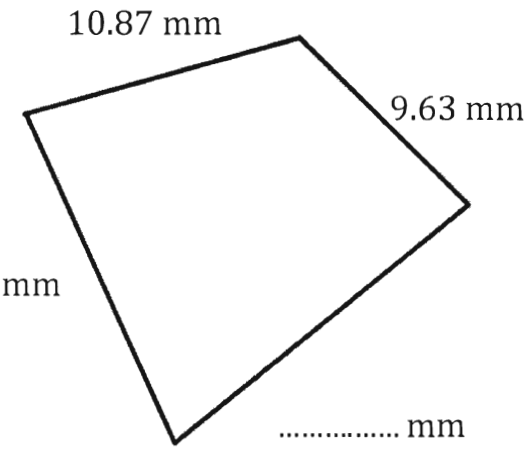
Perimeter = ...



Perimeter = ...

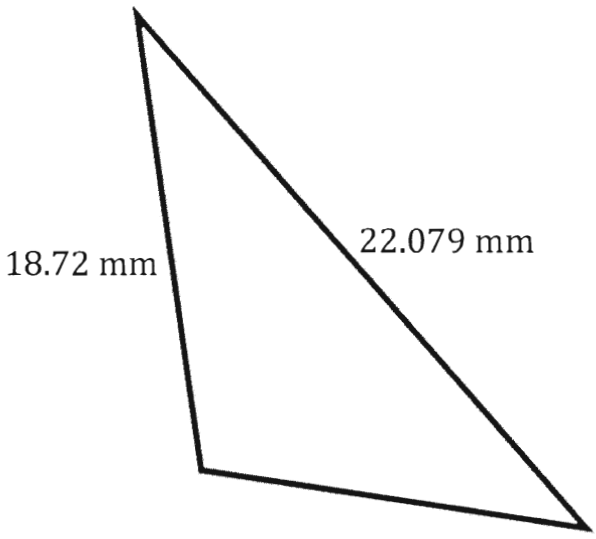
56 Calculate possible values for the missing sides so that the perimeter of each shape is equal to 50 mm:

Not drawn accurately



..... mm

..... mm



..... mm

57 Johan is a street performer. In a day's work he earned £93.71 in the morning and £47.55 in the afternoon. He spent £21.47 on props for his performances. How much profit did he make?

58 A seven-a-side rugby team has a total mass of 663.75 kg.
A player of mass 83.2 kg leaves the team and is replaced by a new player of mass 91.07 kg.
What is the new total mass of the whole team?

59 Three children record their heights every year. Last year they were 0.97 m, 1.02 m and 1.1 m tall.

a) What was the sum of their heights last year?

The sum of their heights this year is 3.4 m.

b) If one has grown by 0.12 m and another by 0.09 m, calculate how much the third child has grown by.

60 Fill in the missing numbers in these multiplication grids.

×	2	4	5	10
1				
3			15	
0				
6		24		

×	3	7	9	11
2				
5				
8			72	
9				

61 Below are the first four multiples of three different numbers. Fill in the missing numbers:

a) 3, 6, 9, 12 are all multiples of .....

b) ....., 12, 18, 24 are all multiples of .....

c) ....., 8, ..., 16 are all multiples of .....

62 Give a **common multiple** of the following numbers.

e.g. 12 is a common multiple of 3 and 6 as it is in **both** the 3 and the 6 times tables.

a) 2 and 5

.....

b) 11 and 5

.....

c) 4 and 7

.....

d) 9 and 3

.....

63 Draw a factor bug for the following numbers:

28 45 60 72

64 Draw Venn diagrams to write down the highest common factor of:

a) 28 and 35
b) 24 and 64

65 Write down 2 numbers that have a highest common factor of 4.

66 Decide whether the following statements are **true** or **false** and circle the correct answer:

a) All multiples of three are also multiples of six. **TRUE / FALSE**

b) All multiples of six are also multiples of three. **TRUE / FALSE**

c) Seven and nine have no common factors. **TRUE / FALSE**

d) All even numbers are divisible by two. **TRUE / FALSE**

e) If a number is divisible by eight it must also be divisible by four. **TRUE / FALSE**

f) Every number is a factor and multiple of itself. **TRUE / FALSE**

g) Every even multiple of five is a multiple of 10. **TRUE / FALSE**

67. Use the given calculations to **write down** the answers to the subsequent calculations.

a) Given calculation: $2 \times 8 = 16$

$2 \times 80 =$ .....

$2 \times 800 =$ .....

$20 \times 8 =$ .....

$200 \times 8 =$ .....

$20 \times 80 =$ .....

b) Given calculation: $3 \times 19 = 57$

$3 \times 190 =$ .....

$3 \times 1900 =$ .....

$30 \times 19 =$ .....

$300 \times 19 =$ .....

$3 \times 18 =$ .....

$6 \times 19 =$ .....

68 Use the given calculations to **write down** the answers to the subsequent calculations.

a) Given calculation: $37 \times 7 = 259$

$37 \times 70 =$ .....

$3700 \times 7 =$ .....

$259 \div 37 =$ .....

b) Given calculation: $74 \times 28 = 2072$

$740 \times 28 =$ .....

$740 \times 2800 =$ .....

$20720 \div 74 =$ .....

69 Fill in the missing numbers in the multiplication grid.

×	20	40	8	50
3				
5			40	
6				
200		8000		

Using the grid method, answer the following.

70

a) 23×6

b) 57×95

c) 142×8

d) 30×245

e) 370×46

f) 299×428

71 Calculate the answers to these division questions, show all working.

a) $4\overline{)472}$

b) $5\overline{)875}$

c) $7\overline{)161}$

d) $4\overline{)376}$

e) $7\overline{)1036}$

f) $8\overline{)8072}$

f) $14\overline{)392}$

g) $15\overline{)675}$

72 We can use rounding to estimate the answers to calculations, for example, $29 \times 37 \approx 30 \times 40 = 1200$.
Estimate answers to the following calculations, **showing your working out:**

a) $22 \times 31 \approx$ .....

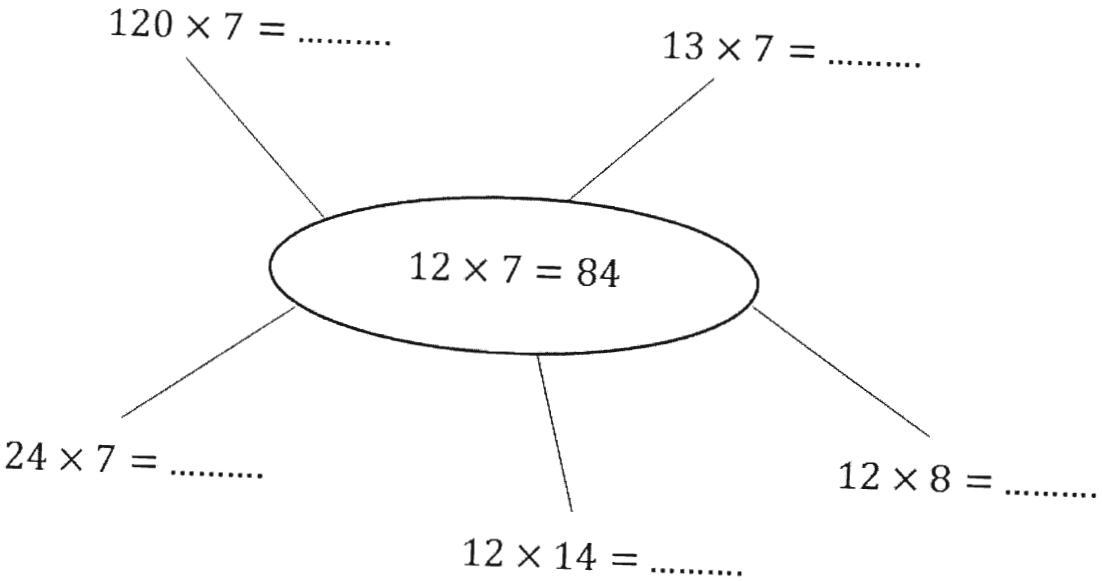
b) $53 \times 78 \approx$ .....

c) $59 \times 55 \approx$ .....

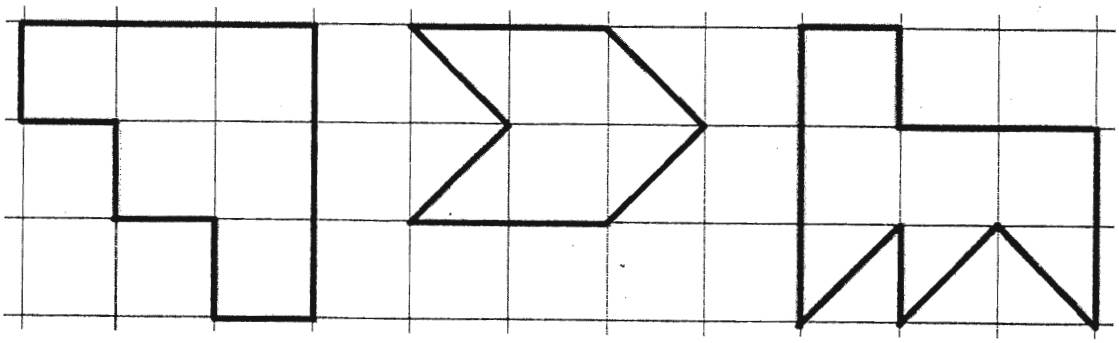
d) $103 \times 86 \approx$ .....

e) $390 \times 417 \approx$ .....

73 We can create 'extended fact families' from given multiplication calculations. Complete the diagrams below.

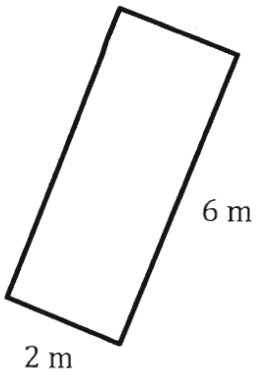


74 Give the area of each shape below (in squares) by counting the number of squares:

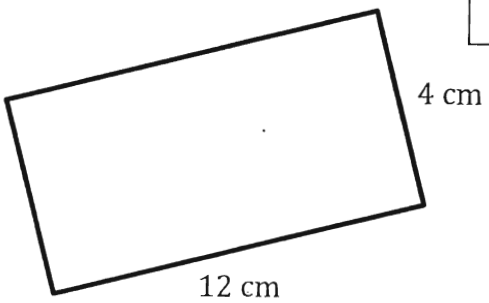


Area = ... Area = ... Area = ...

75 Calculate the area of these rectangles. Don't forget to write the correct units.

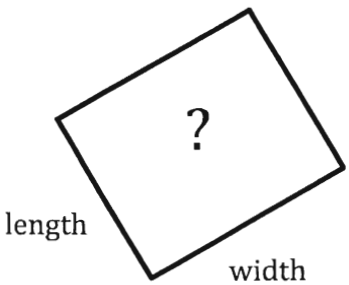


Diagrams not drawn accurately



Area = ... Area = ...

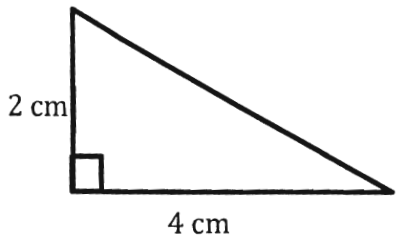
76 Fill in the table to show the area of each rectangle:

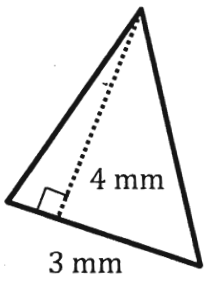


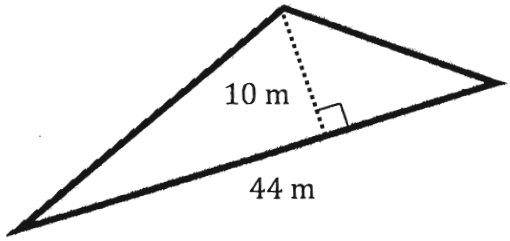
Length	Width	Area
3 cm	4 cm	
3 cm	40 cm	
	4 cm	120 cm^2
300 cm	40 cm	

77 Calculate the area of these triangles:

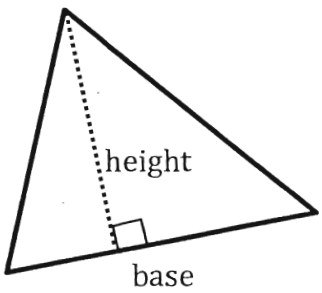
Diagrams not drawn accurately







78 Fill in the gaps in the table:

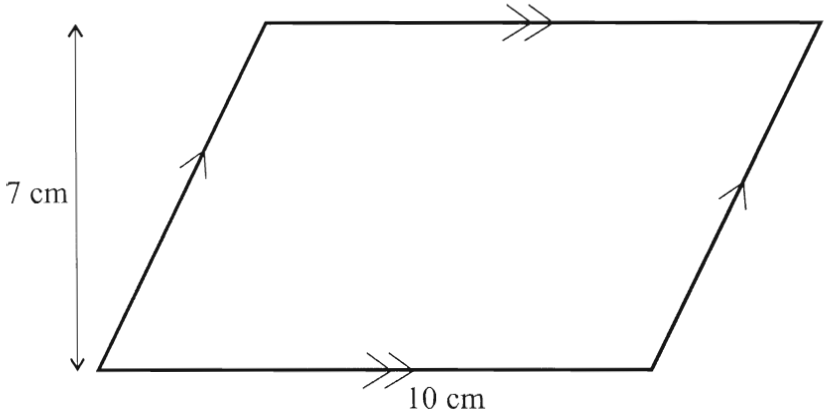


Base	Height	Area
3 cm	4 cm	
6 cm	4 cm	
3 cm	8 cm	
	8 cm	$48cm^2$

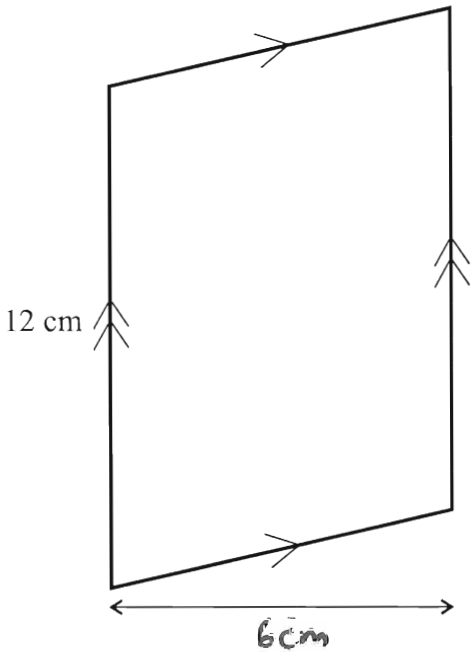
Area of a Parallelogram

79 Find the area of each of these parallelograms.

a)

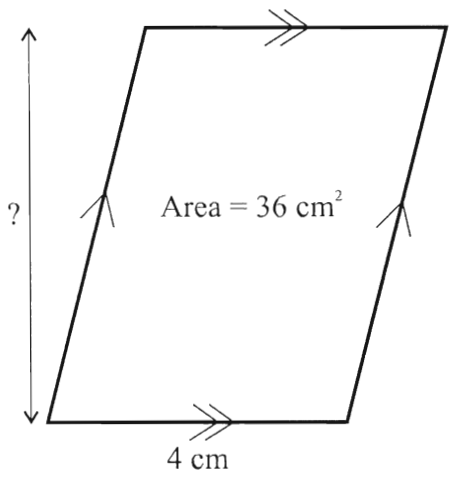


b)

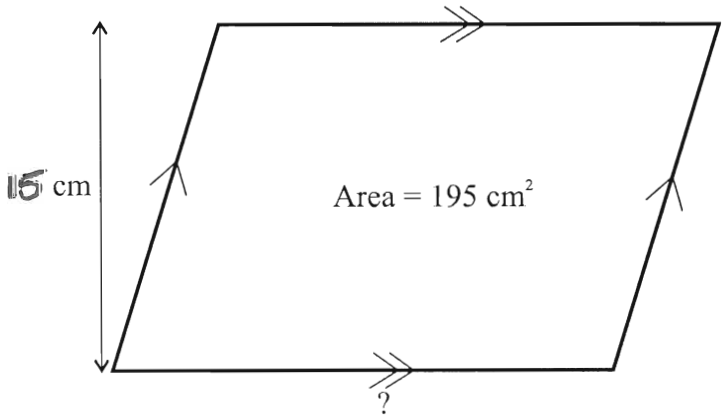


80 Find the missing lengths in these two parallelograms.

a)



b)



Calculate the following:

81 a) $7 \times 4 =$

$0.7 \times 4 =$

$7 \times 0.4 =$

$0.7 \times 0.4 =$

b) $12 \times 3 =$

$1.2 \times 3 =$

$12 \times 0.3 =$

$1.2 \times 0.3 =$

82 Work out 23×6

Now write the answers to:

$2.3 \times 6 =$

$23 \times 0.6 =$

$2.3 \times 0.6 =$

$0.23 \times 0.06 =$

83 Calculate the following

a) 6×0.3

b) 0.2×9

c) 5×0.7

d) 0.06×4

e) 0.007×11

84 Estimating an answer can be helpful as it gives an indication of the answer you should expect. Fill in the boxes below, giving an estimate for each calculation (note: "≈" means approximately equal to):

Estimate the answer to 18.7 × 3.01	**Estimate the answer to 3.9 × 1.7**
18.7 ≈ .....(to the nearest ten)	3.9 ≈ .....(to the nearest integer)
3.01 ≈ .....(to the nearest integer)	1.7 ≈ .....(to the nearest integer)
.....× .....=	.....× .....= .....

85 Calculate an estimate for:

i) $4.8 \times 0.8 \approx$ ..... × ..... = ...

ii) $19.7 \times 3.8 \approx$ ..... × ..... = ...

iii) $1.89 \times 43.6 \approx$ ..... × ..... = ...

86 Each calculation in the top line matches a calculation in the line below. Draw lines linking each pair of calculations then write the answer in the space below each one:

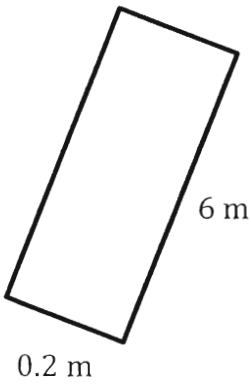
$6 \times 3 \div 100$	$7 \times 2 \div 10$	$5 \times 5 \div 1000$	$9 \times 7 \div 100$

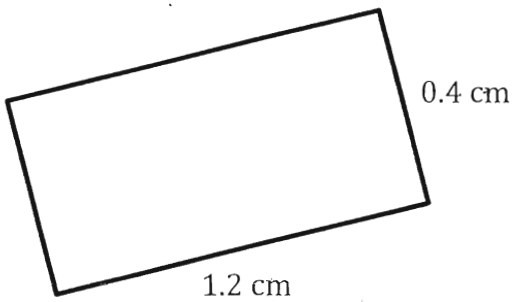
0.5×0.05	9×0.07	0.6×0.3	7×0.2
↓	↓	↓	↓
.....	.....	.....	.....

87 Decide whether these calculations will be less than or more than 1. Insert the correct symbol.

0.1×8		1
0.2×9		1
20×0.4		1
0.2×0.3		1
0.2×20		1

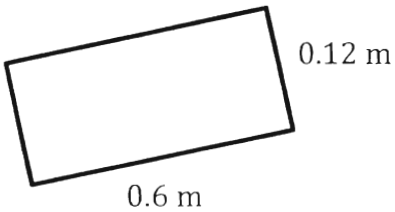
88 Calculate the areas of these rectangles, remembering to give the correct units in your answers.

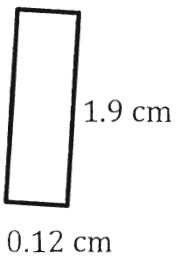




Area = ...

Area = ...

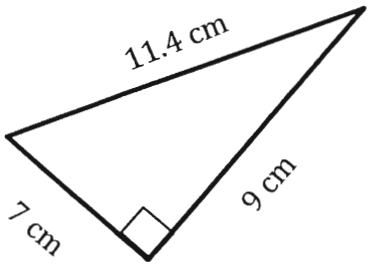


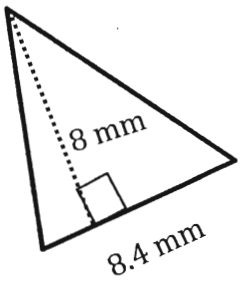


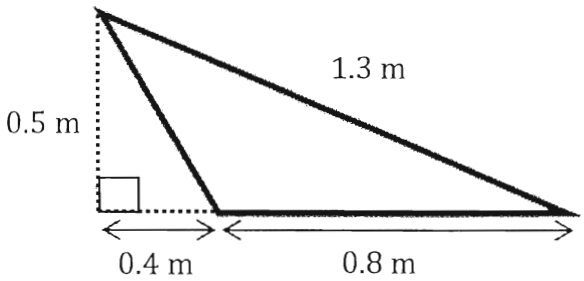
Area = ...

Area = ...

89 Calculate the areas of these triangles:







Area = ...

Area = ...

Area = ...

90 Calculate the answers to these division questions

a) $37 \div 2$

b) $83 \div 5$

c) $147 \div 4$

d) $821 \div 4$

91. Write these division calculations in ascending order.

$25 \div 3$ $79 \div 10$ $17.9 \div 2$ $35 \div 4$

92 Kieran is buying tiles for his bathroom.
For the floor he needs 27 tiles. The tiles come in packs of 5. How many packs will Kieran need to buy?

93 We can use known facts to help calculate more difficult divisions.

For example $6 \div 3 = 2$ so $6 \div 30 = 0.2$

Calculate:

a) $8 \div 4 =$
$8 \div 40 =$

b) $15 \div 5 =$
$15 \div 50 =$

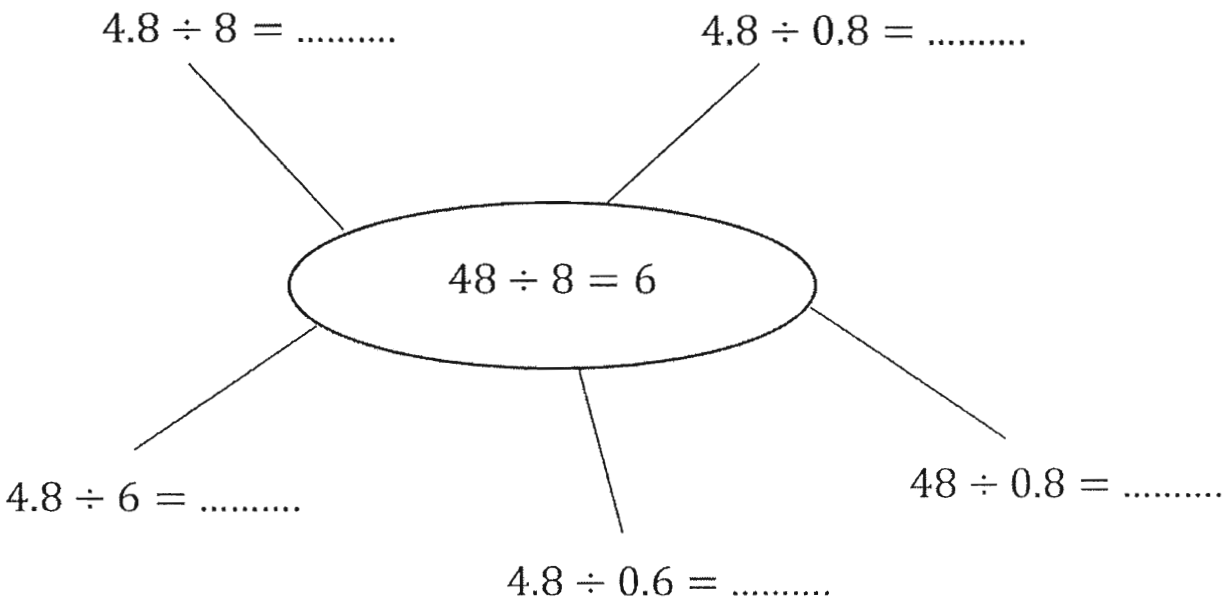
c) $30 \div 5 =$
$30 \div 50 =$

d) $24 \div 6 =$
$24 \div 60 =$

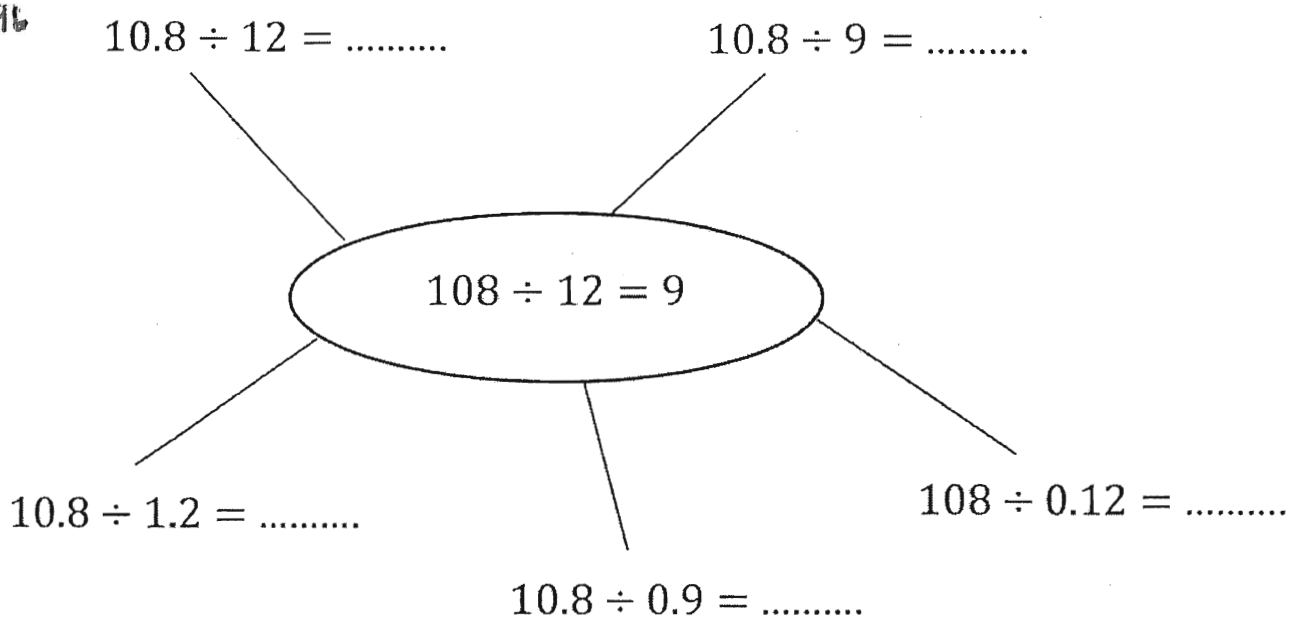
94 Match up the equivalent calculations:

$6 \div 0.2$	$120 \div 3$
$12 \div 0.3$	$20 \div 5$
$3.6 \div 0.2$	$600 \div 2$
$60 \div 0.2$	$36 \div 2$
$0.2 \div 0.05$	$60 \div 2$

95 Complete the diagrams below:



96



97

You are given one statement below. Use it to write down the answers to the other calculations:

60 ÷ 4 = 15

a) 60 ÷ 0.4 = ...

b) 60 ÷ 40 = ...

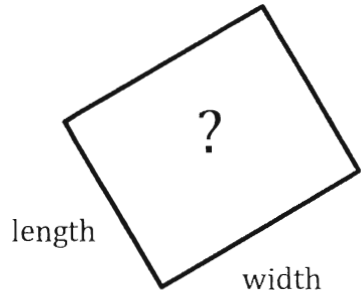
c) 6 ÷ 0.4 = ...

d) 60 ÷ 0.04 = ...

e) 60 ÷ 15 = ...

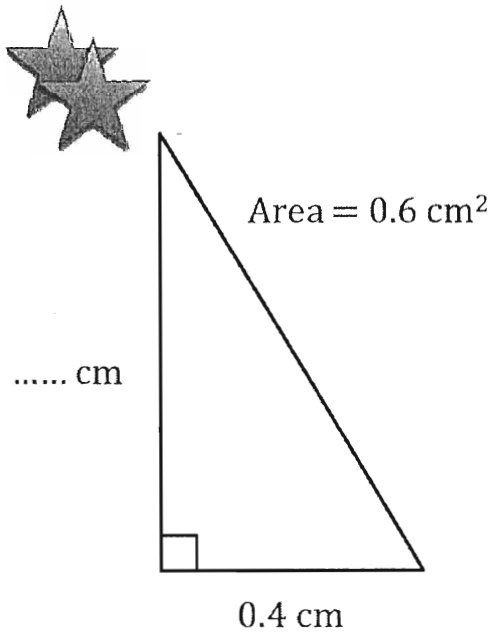
f) 6 ÷ 15 = ...

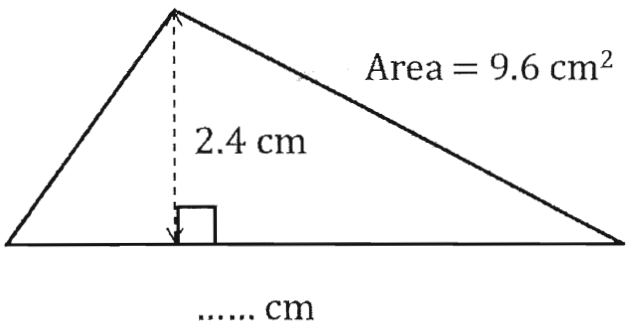
98 Fill in the table to show the area of each rectangle:



Length	Width	Area
2 cm	3 cm	
0.2 cm	30 cm	
200 cm	0.03 cm	
	0.03 cm	0.0006 cm^2
20 m		6 m^2

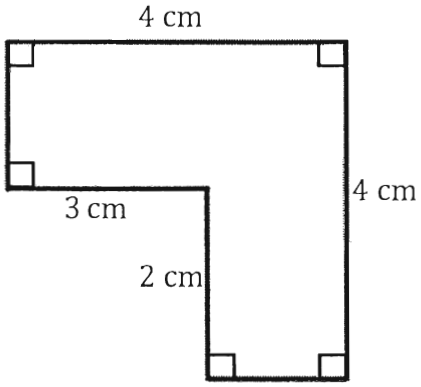
99 Calculate the missing dimensions of these triangles:



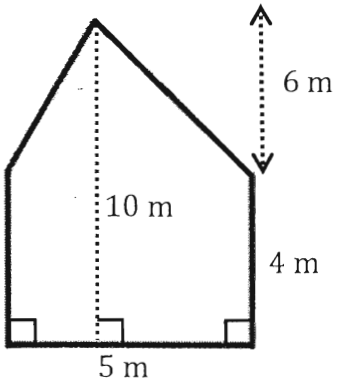


160 **Problems using multiplication and division**

Calculate the area of these compound shapes (you may need to find some side lengths):

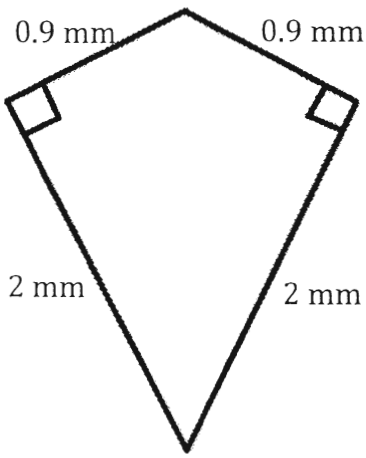


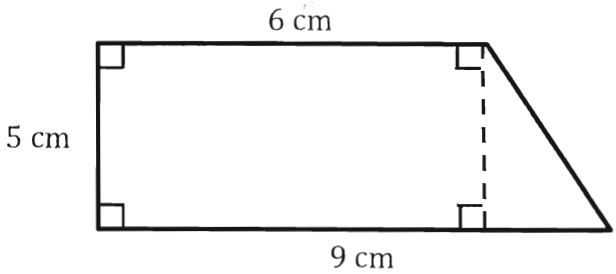
Diagrams not drawn accurately



Area = ...

Area = ...





Area = ...

Area = ...

10) At a restaurant the staff members combine their tips and divide the total evenly between each person that worked that night. Calculate how much each member of staff will get for each evening below:

a) On Thursday they collected £69.88 in total and there were four members of staff working:

Each staff member gets £.....

b) On Friday they collected £123 in total and there were five members of staff working:

Each staff member gets £.....

c) On Saturday they collected £153.71 in total and there were seven members of staff working (think carefully about your final answer):

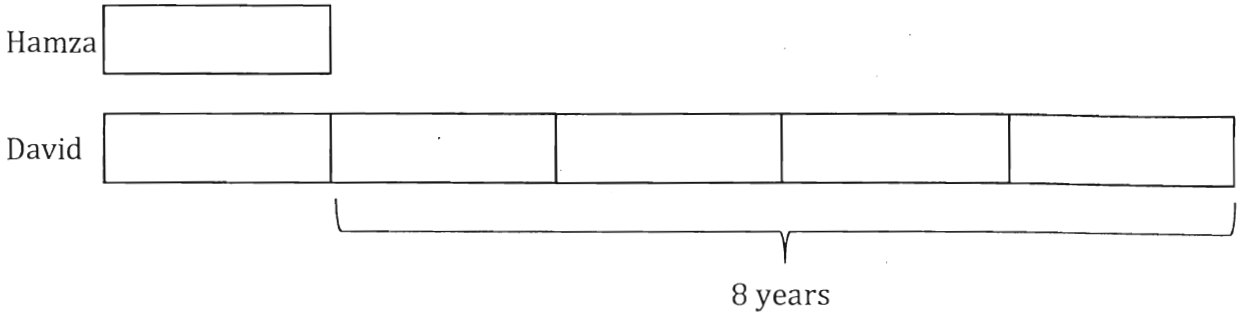
Each staff member gets £.....

d) Why was Saturday's answer different? What might they have done to resolve this?

.....

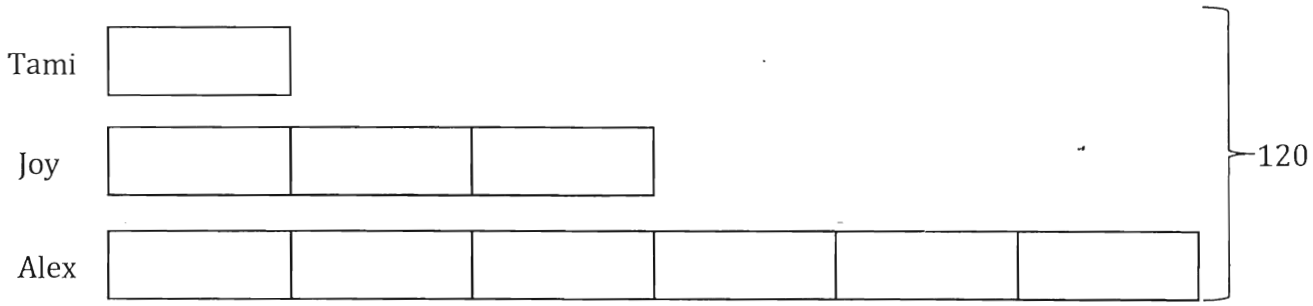
.....

102 David is five times as old as Hamza. The difference between their ages is 8 years. Use the bar model below to calculate both their ages:



Hamza is ..... and David is .....

Tami, Joy and Alex collect cars. Joy has three times as many cars and Tami, and Alex has twice as many as Joy. In total they have 120 cars. You may use the bar model to calculate how many cars each of them have:



Tami has ....., Joy has .....and Alex has .....

103 I pick three numbers. The second number is three times the size of the first, and the third number is four times the size of the first. The sum of the three numbers is 72. You may use bar modelling to represent this problem and find the value of each number:

The numbers are ....., ... and .....

104 Match each statement to the appropriate measure, and then to an estimate of the length.

the length of a ballpoint pen	**kilometres**	**200 m**
the shortest distance from England to France	**millimetres**	**33 km**
the length of a train	**centimetres**	**15 cm**
the height of an ant	**metres**	**3 mm**

105 Write down an estimate, with appropriate **metric** units for the measurements below.

a) The height of an 11-year-old girl

.....

b) The diagonal length of a TV screen

.....

c) The thickness of a mobile phone

.....

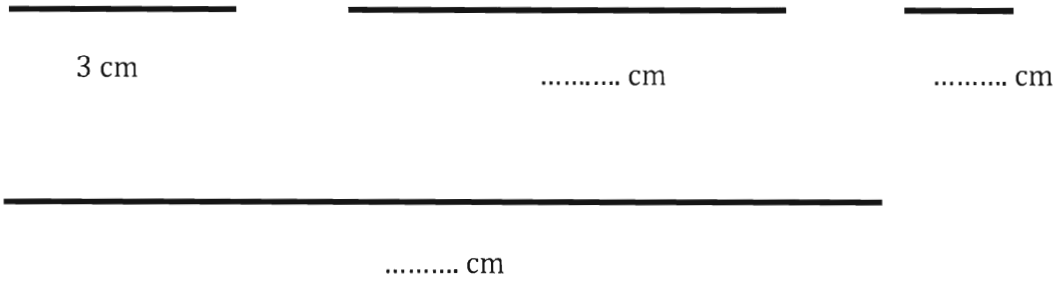
d) The height of a four-storey block of flats

.....

e) The distance from New York to Manchester

.....

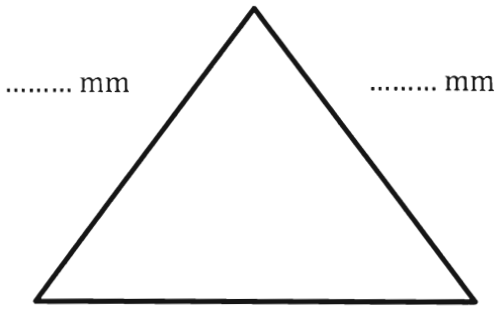
106 The first line below is 3 cm in length. Use it to **estimate** the length of the other lines.



3 cm ..... cm ..... cm

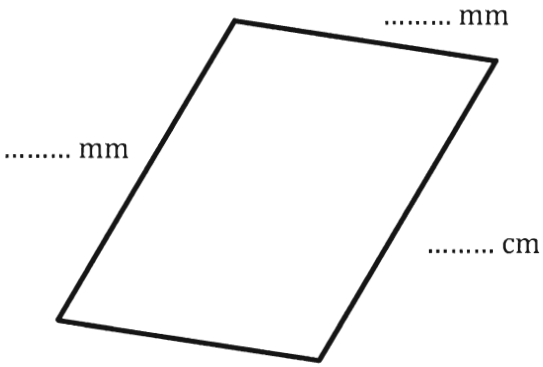
..... cm

107 Measure the side lengths of the shapes below. Use the units stated.



..... mm ..... mm

..... cm



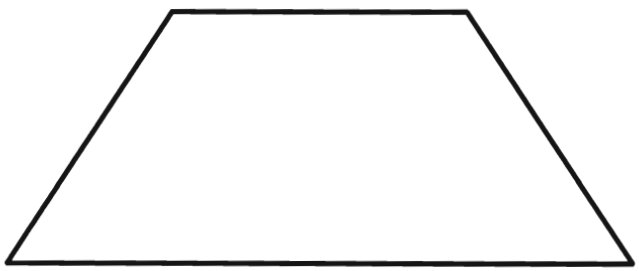
..... mm

..... mm

..... cm

..... cm

108 Measure the lengths of each side of the shape below and calculate its perimeter:



The perimeter is ..... mm.

109 Estimate the mass of the following objects, giving appropriate **metric** units:

a) the mass of an average person

.....

b) the mass of a small dog

.....

c) the mass of a bowling ball

.....

d) the mass of a snowflake

.....

e) the mass of a fire engine

.....

110 Match up the equivalent measurements.

120 cm	1.2 cm
12 mm	12 000 m
12 km	1.2 m
12 cm	0.12 m

111 Convert each measurement into the units stated.

a) 300 cm = ... m

b) 42 mm = ... cm

c) 17 km = ... m

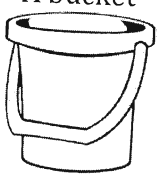
d) 3240 m = ... km

112 Match up the following equivalent measurements

217 g	21.7 kg
2170 mg	0.217 kg
21.7 g	0.0217 kg
21 700 g	2.17 g

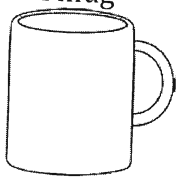
113 Match the container to the correct capacity for each image below:

A bucket



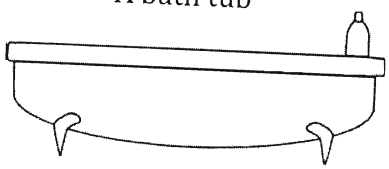
140 litres

A mug



350 millilitres

A bath tub



5 millilitres

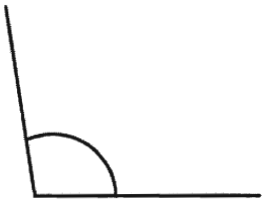
A teaspoon

12 litres

114 Match up the equivalent measures

384 ml	38.4 ml
3840 ml	0.384 *l*
38.4 *l*	38 400 ml
0.0384 *l*	3.84 *l*

Write down whether each of these angles is acute, obtuse or reflex.
Estimate the size of each angle. Remember to give your units.

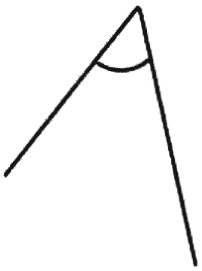


Type of angle .....

Estimate .....

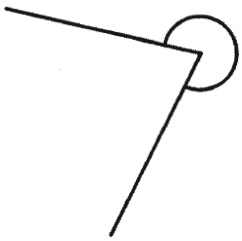
Type of angle .....

Estimate .....



Type of angle .....

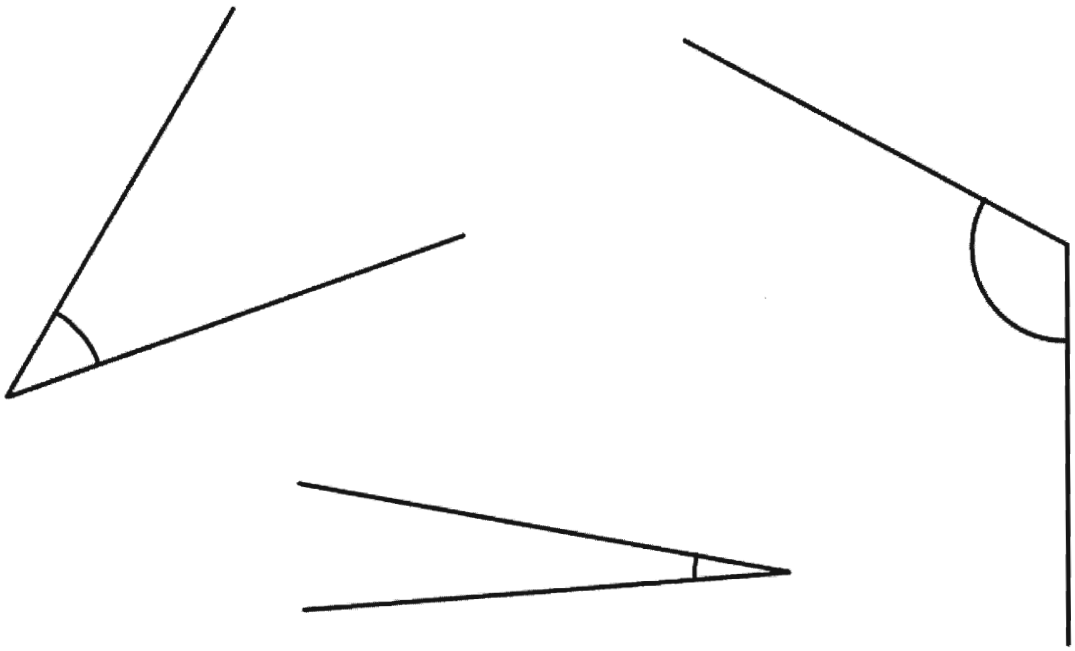
Estimate .....



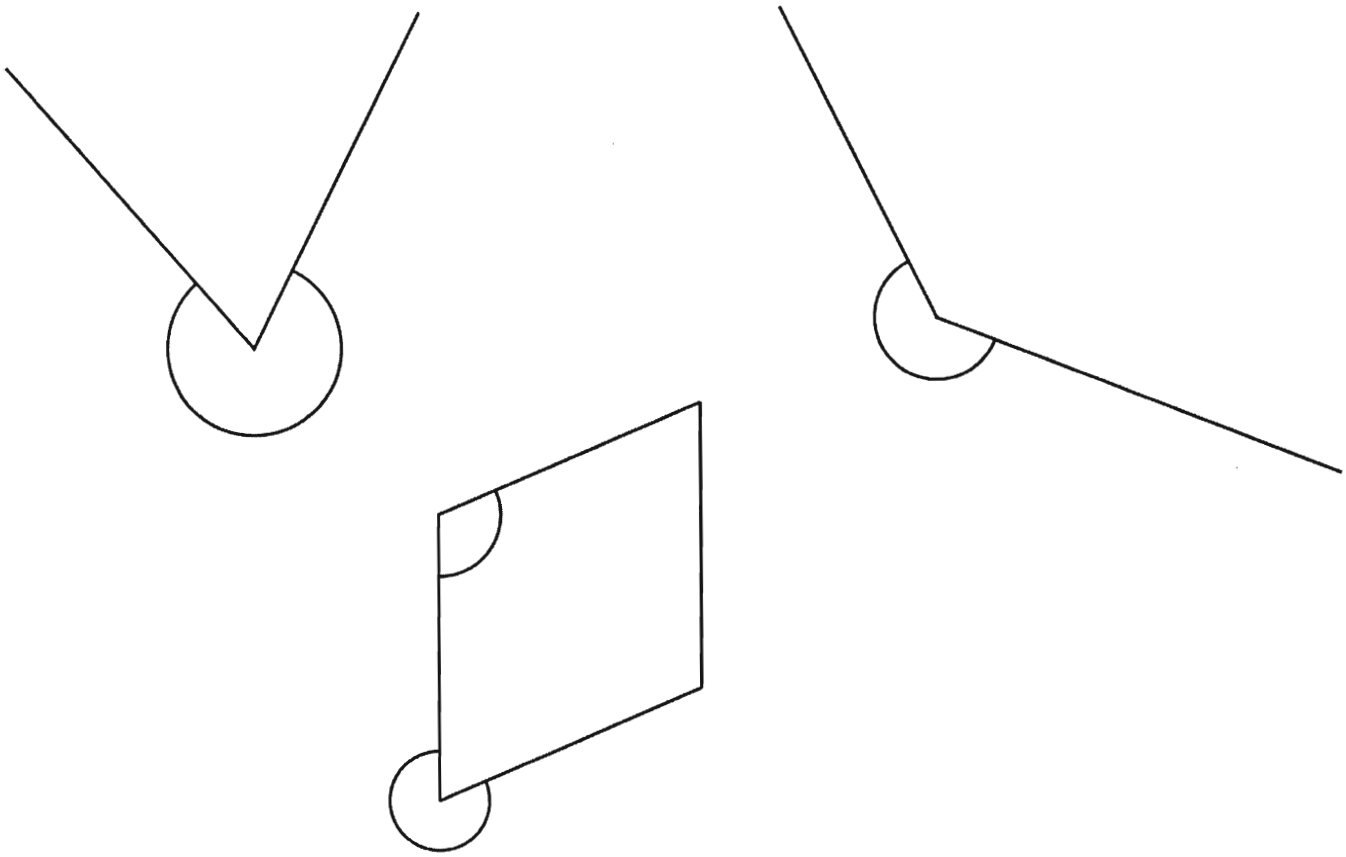
Type of angle .....

Estimate .....

116. Measure the marked angles:



117. Measure the marked angles:

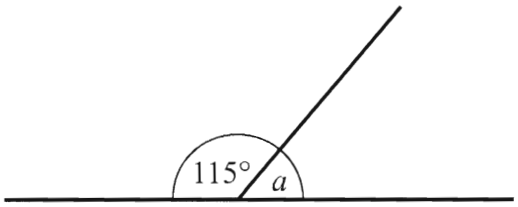


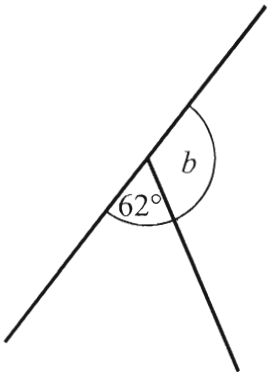
118 Use your protractor to draw the following angles accurately.

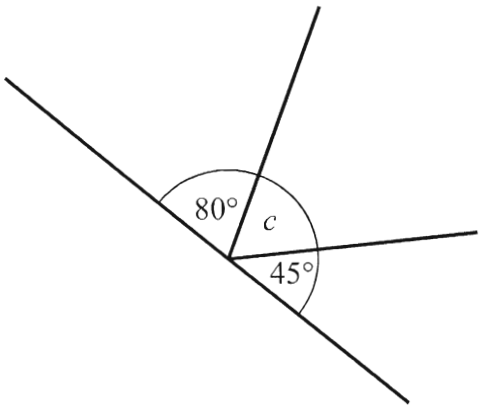
a) 25° b) 105° c) 84° d) 175°

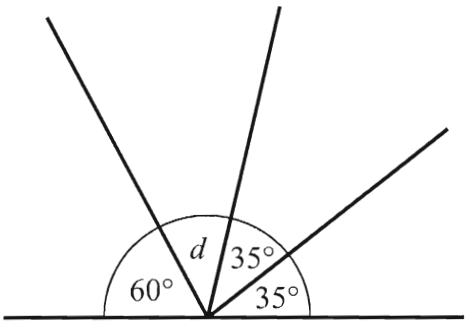
Angles on a Line and at a Point

119 Work out the values of the unknown angles.

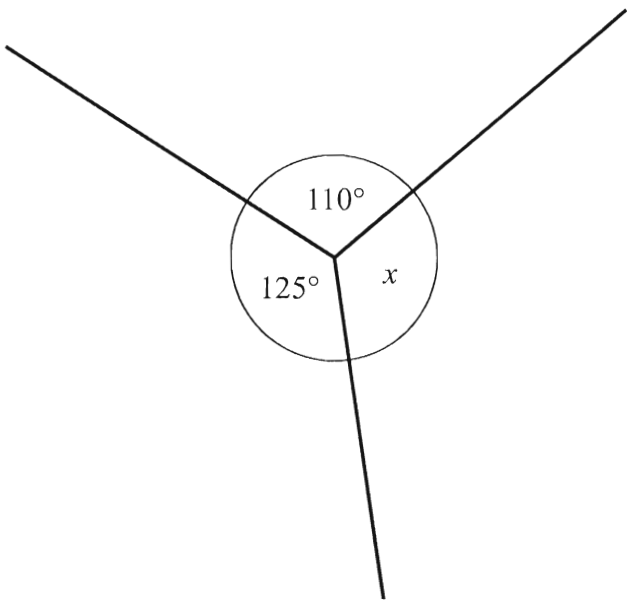


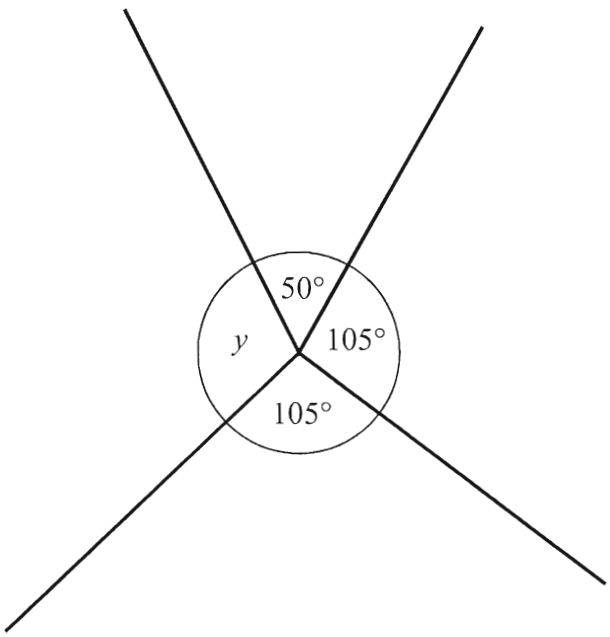




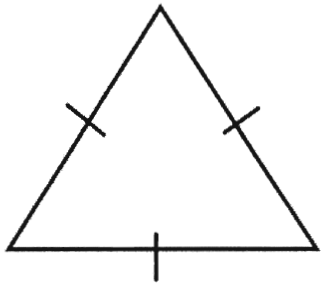


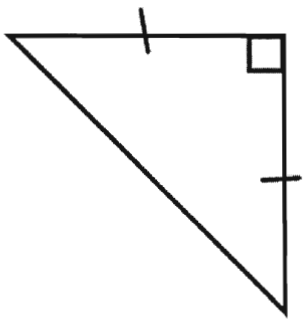
Work out the values of the unknown angles.

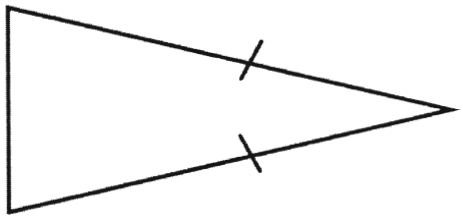




120 Mark the angles that are equal in each of the triangles below:







121 Write down the mathematical name for each triangle described below.

a) A triangle with sides of 4 cm, 7 cm and 8 cm and angles of 30°, 61° and 89°.

.....

b) A triangle in which all sides are 11 cm long.

.....

c) A triangle with one angle of 58° and two angles of 61°.

.....

d) A triangle in which two angles are 60°.

.....

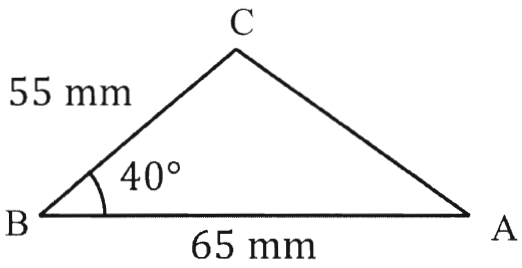
e) A triangle with one angle of 90° and two equal sides.

.....

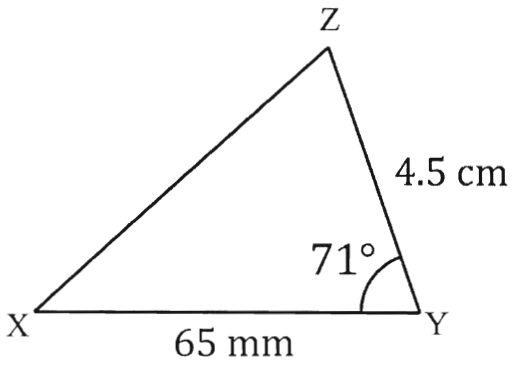
122 Construct each of the following triangles and measure the third side.

Diagrams not drawn accurately

a)



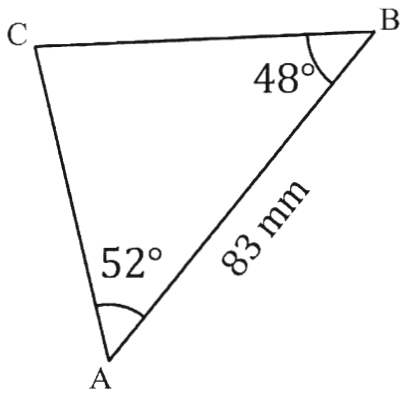
b)



123 Construct the following triangles. Once constructed, give the length of the side AC.

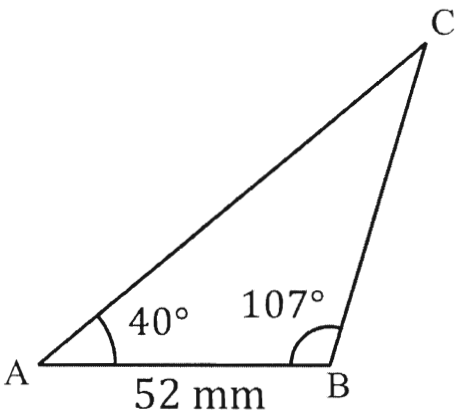
Diagrams not drawn accurately

a)



$AC =$.....

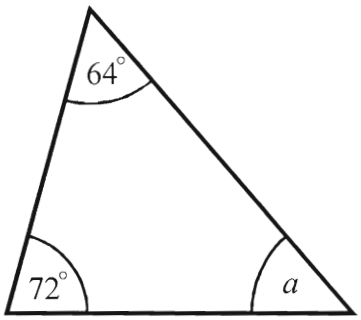
b)



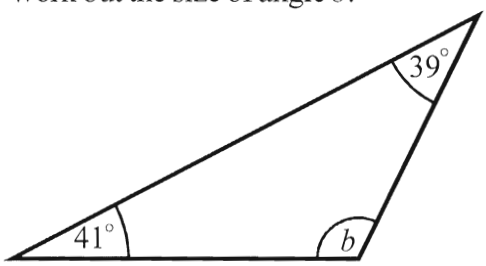
$AC =$.....

Angles in a Triangle

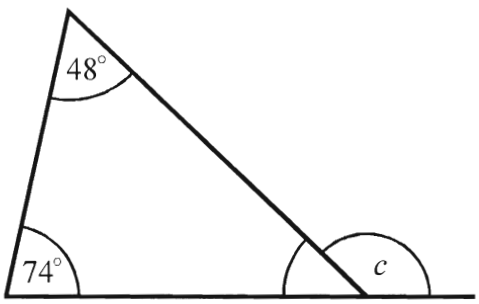
124 Work out the size of angle a.



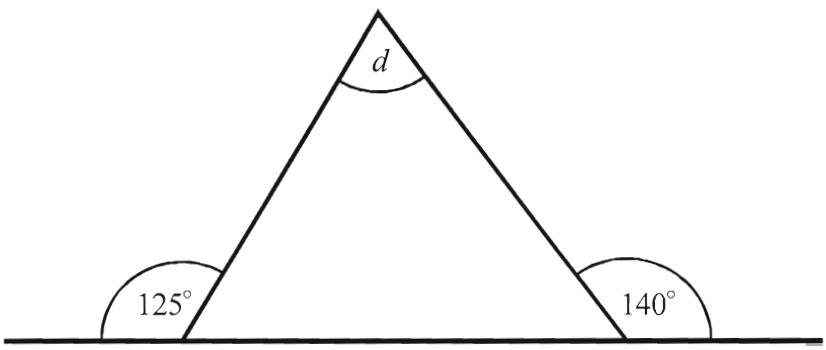
125 Work out the size of angle b.



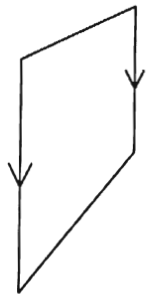
126 Work out the size of angle c.



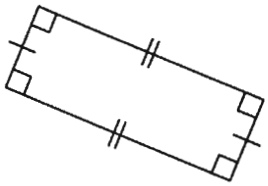
127 Work out the size of angle d.



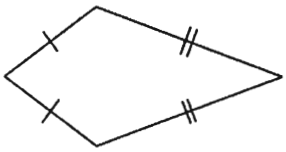
128 Match each quadrilateral to one correct name:



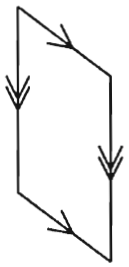
square



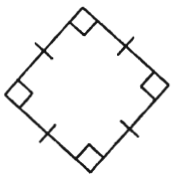
rhombus



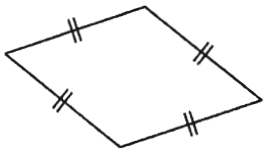
parallelogram



trapezium

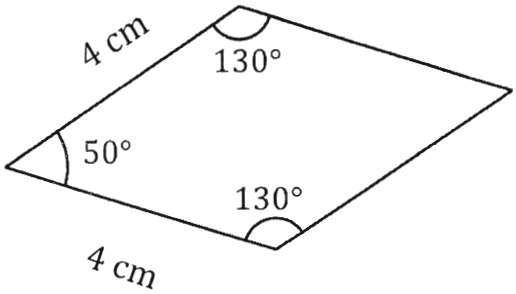


rectangle



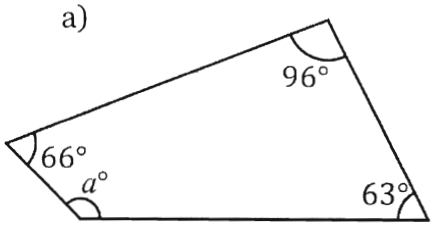
kite

129 Make accurate drawings of the quadrilaterals below.
Measure the missing sides and angles.

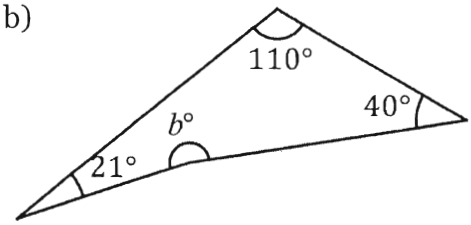


130 Calculate the size of the missing angles.

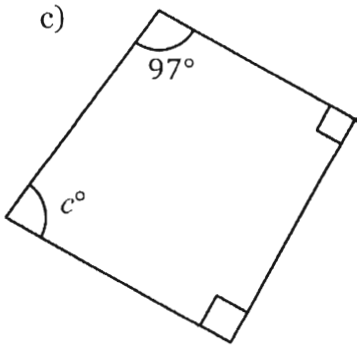
a)



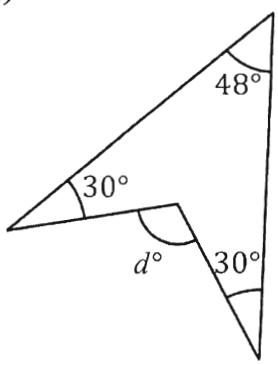
b)



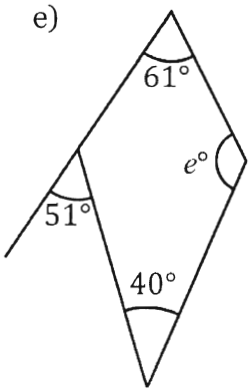
c)



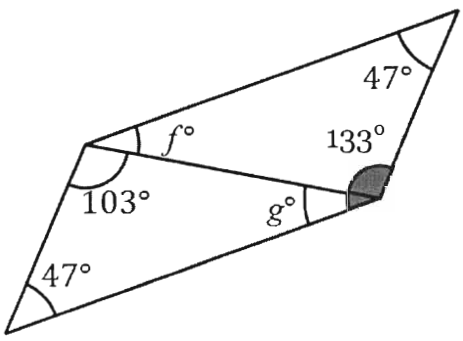
d)



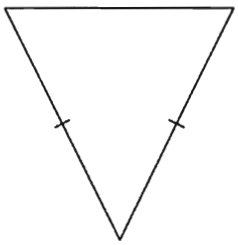
e)

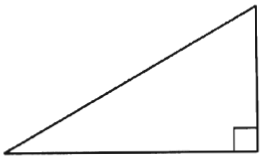


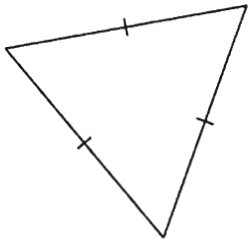
f)

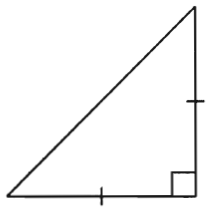


131 Write down the mathematical name for each of these triangles and where possible, draw all their lines of symmetry.

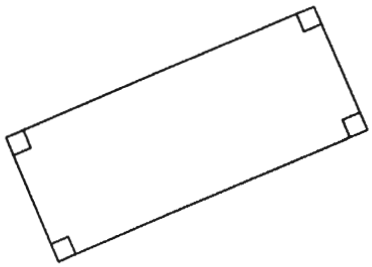


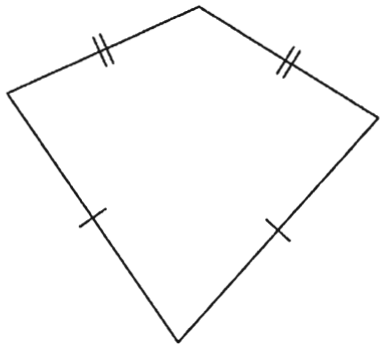


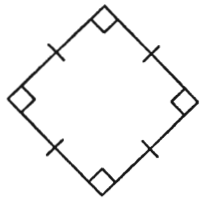


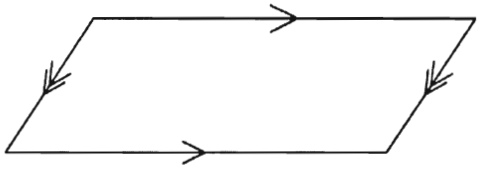


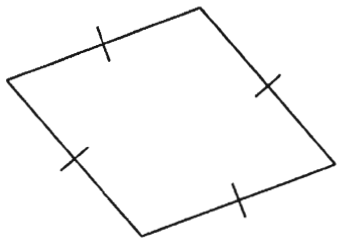
132 Write down the mathematical name for each of these special quadrilaterals and where possible, draw all their lines of symmetry.





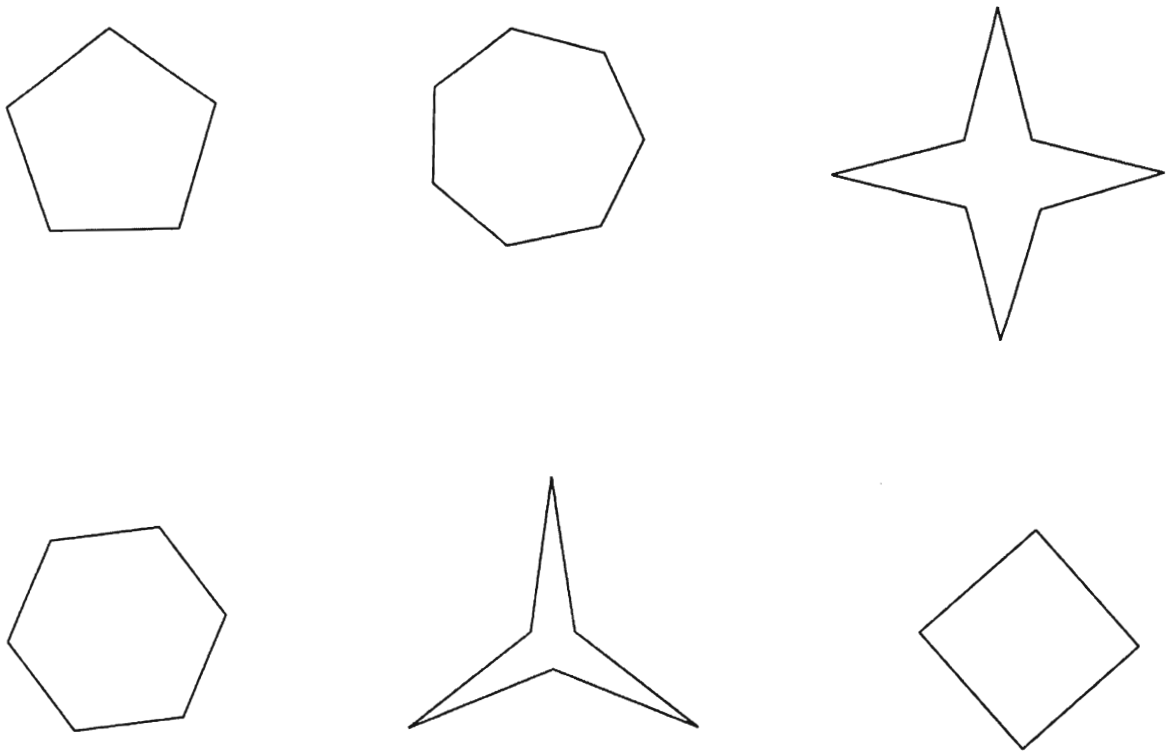






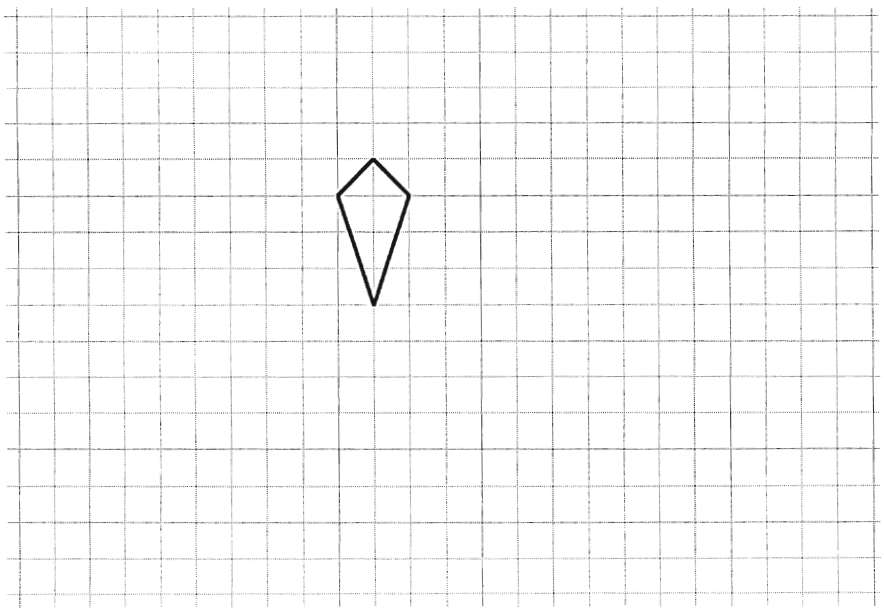
133

Write down the order of rotational symmetry of each of the following shapes.



134

Show that this shape tessellates. Draw at least 6 copies of the shape.

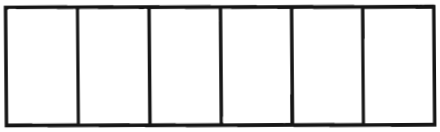


135 Place the following fractions on the number line

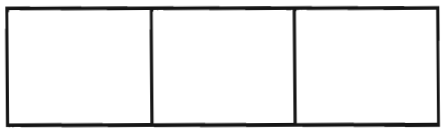
$\frac{1}{2}$, $\frac{2}{5}$, $\frac{1}{10}$, $\frac{1}{20}$

136 a) Shade $\frac{1}{3}$ of this shape

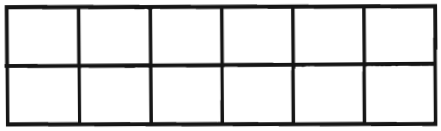
b) Shade $\frac{2}{6}$ of this shape



c) Shade $\frac{2}{3}$ of this shape



d) Shade $\frac{1}{3}$ of this shape



Which is the odd one out? Explain why:

137 Match up the equivalent fractions:

$\frac{8}{12}$	$\frac{1}{2}$
$\frac{6}{10}$	$\frac{3}{9}$
$\frac{5}{15}$	$\frac{2}{3}$
$\frac{12}{24}$	$\frac{18}{30}$

138 In a class, 12 students were boys and 18 were girls.
What fraction of students were boys?

Write your answer in its simplest form.

139 Conor had 34 sweets. He ate 12 of them.
Conor gave 7 of the sweets he had left to Harris and the rest to Flora.
What fraction of the original sweets did Flora get?

140 Match each improper fraction to its equivalent mixed number representation.

$\frac{15}{4}$	$3\frac{2}{3}$
$\frac{11}{3}$	$2\frac{1}{4}$
$\frac{11}{4}$	$3\frac{3}{4}$
$\frac{9}{4}$	$1\frac{1}{3}$
$\frac{4}{3}$	$2\frac{3}{4}$

141 Write the following fractions in **ascending order**.

$$\frac{17}{6}, \quad \frac{16}{3}, \quad \frac{7}{4}, \quad \frac{19}{5}$$

142 Write a >, = or < between these improper factions and mixed numbers.

$\frac{13}{4}$	$2\frac{3}{4}$
$\frac{18}{5}$	$3\frac{3}{5}$
$6\frac{2}{9}$	$\frac{20}{5}$
$1\frac{9}{17}$	$\frac{17}{9}$

143 Fill in the gaps in the table below.

Decimal	Words	Fraction
0.74	• seventy-four hundredths • seven tenths and four hundredths	$\frac{74}{100}$
0.6		
0.09		
	• ..... • one tenth and one hundredth	
		$\frac{37}{100}$

144 Express as a decimal:

a) $\frac{1}{10}$

b) $\frac{3}{100}$

c) $\frac{7}{1000}$

d) $\frac{38}{100}$

e) $\frac{131}{1000}$

145 Express $\frac{2}{5}$ as a decimal.

Explain your answer.

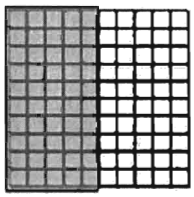
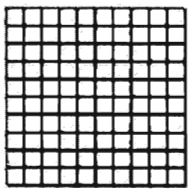
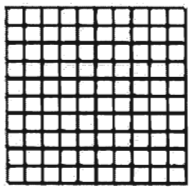
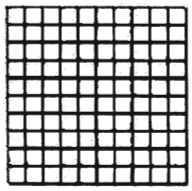
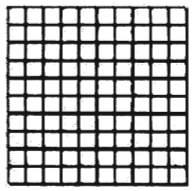
146 . Use the cards below to write down fractions and decimals equivalent to:

a) 3%

b) 30%

c) 300%

0.3	3	$\frac{3}{1}$	$\frac{3}{100}$
0.03	0.30	$\frac{3}{10}$	$\frac{30}{100}$

Pictorial (shading)	Fraction	Decimal	$\frac{\quad}{100}$	Percentage
				
			$\frac{30}{100}$	
		0.1		
	$\frac{7}{10}$			
				55%

148

Calculate

a) $\frac{1}{2}$ of 12 =

b) $\frac{1}{4}$ of 32 =

c) $\frac{1}{5}$ of 15 =

d) $\frac{1}{8}$ of 40 =

e) $\frac{1}{12}$ of 84 =

149 Calculate the following. You may give your answers as fractions or decimals.

a) $\frac{1}{2}$ of 19

b) $\frac{1}{10}$ of 25

c) $\frac{1}{4}$ of 37

d) $\frac{1}{5}$ of 42

e) $\frac{1}{3}$ of 50

150 Calculate:

a) $\frac{3}{4}$ of 24 =

b) $\frac{4}{5}$ of 20 =

c) $\frac{3}{7}$ of 14 =

d) $\frac{3}{8}$ of 64 =

e) $\frac{7}{8}$ of 56 =

f) $\frac{9}{4}$ of 28 =

g) $\frac{13}{6}$ of 30 =

h) $\frac{5}{2}$ of 14 =

i) $\frac{3}{5}$ of £21 =

j) $\frac{17}{5}$ of 4 =

151

. In a Chemistry test there are 80 marks. Chris gets $\frac{3}{5}$ of the marks.

How many marks does he get?

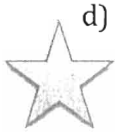
152 Find the value of the number when:

a) $\frac{1}{2}$ of the number is 11

b) $\frac{1}{3}$ of the number is 8

c) $\frac{1}{7}$ of the number is 4

d) $\frac{1}{4}$ of the number is 7.3



153 $\frac{1}{3}$ of Jake's weekly pocket money is exactly £2.30.

How much pocket money does he get each week?

154 Find the value of:

a) The number when $\frac{2}{3}$ of the number is 8

b) The number when $\frac{3}{5}$ of the number is 12

Multiplying Fractions

In all the questions on this page, please give your answers in their simplest form.

155 Work out the following:

a) $\frac{1}{2} \times \frac{1}{2}$

b) $\frac{2}{3} \times \frac{1}{3}$

c) $\frac{3}{5} \times \frac{2}{7}$

d) $\frac{4}{7} \times \frac{5}{9}$

156 Work out the following:

a) $\frac{1}{2} \times \frac{2}{3}$

b) $\frac{3}{4} \times \frac{8}{11}$

c) $\frac{2}{9} \times \frac{3}{4}$

d) $\frac{4}{5} \times \frac{1}{12}$

157 Work out the following:

a) $1\frac{1}{2} \times \frac{1}{3}$

b) $\frac{2}{3} \times 2\frac{2}{5}$

c) $3\frac{1}{2} \times 1\frac{1}{2}$

d) $1\frac{2}{7} \times 3\frac{1}{3}$

Dividing Fractions

In all the questions on this page, please give your answers in their simplest form.

158 Work out the following:

a) $\frac{2}{5} \div \frac{3}{4}$

b) $\frac{1}{7} \div \frac{3}{5}$

c) $\frac{4}{9} \div \frac{1}{2}$

d) $\frac{3}{10} \div \frac{5}{9}$

159 Work out the following:

a) $\frac{1}{2} \div \frac{1}{3}$

b) $\frac{3}{7} \div \frac{4}{7}$

c) $\frac{1}{9} \div \frac{2}{3}$

d) $\frac{2}{5} \div \frac{3}{10}$

160 Work out the following:

a) $1\frac{1}{3} \div \frac{1}{4}$

b) $\frac{3}{5} \div 2\frac{2}{3}$

c) $3\frac{2}{3} \div 1\frac{1}{5}$

d) $4\frac{1}{2} \div 1\frac{1}{2}$

161. Work out

(a) $7 + 2 \times 3$ (b) $9 + 4 \times 2$ (c) $10 + 2 \times 2$ (d) $18 + 4 \div 2$

(e) $20 - 5 \times 2$ (f) $8 - 2 \times 3$ (g) $21 - 9 \div 3$ (h) $100 - 40 \times 2$

(i) $16 \div 1 - 3$ (j) $5 + 5 \times 5$ (k) $13 - 7 \div 1$ (l) $7 \times 6 - 4$

(m) $9 + 3 - 2$ (n) $20 - 5 + 6$ (o) $21 - 17 + 4$ (p) $30 \times 4 \div 2$

(q) $(7 + 7) \div 2$ (r) $35 - (9 + 3)$ (s) $40 \times (2 + 3)$ (t) $60 \div (1 + 5)$

(u) $15 \div (3 + 2)$ (v) $9 \times (7 + 4)$ (w) $90 \div (52 - 7)$ (x) $(8 + 9) \times 3$

(y) $10 + 5 + 3 \times 3$ (z) $100 - 6 + 2 \times 3$

162. Work out

(a) $5 - 2^2$ (b) $7 + 3^2$ (c) $9^2 + 1$ (d) $6^2 - 5^2$

(e) $(7 - 2)^2$ (f) $(4 + 3)^2$ (g) $(1 + 2)^3$ (h) $(2 + 8)^3$

(i) $10 - \sqrt{16}$ (j) $\sqrt{(2 + 14)}$ (k) $\sqrt{4} + 3^2$ (l) $2 \times 5 - \sqrt{4}$

163. Work out

(a) $5 \times 3 + 2 \times 6$ (b) $9 \div 3 + 15 \times 2$ (c) $10 \div 2 - 2 \times 1$ (d) $5 \times (2 + 1) + 4$

(e) $8 + (5 - 1) \times 3$ (f) $50 - (1 + 4) \times 4$ (g) $19 \times 2 + 5^2$ (h) $8^2 + 2 \times 3^2$

(i) $7 \times (8 \div 4)^2$ (j) $11 + 11 - 6^2 \div 2$

164. Copy out the following and insert brackets in each to make the correct answer.

(a) $10 \times 2 + 6 = 80$ (b) $5 + 5 \div 5 = 2$ (c) $18 - 6 \div 2 = 6$

(d) $5 + 2 \times 3 + 1 = 13$ (e) $2 \times 7 + 1 \times 3 = 48$ (f) $9 + 3^2 \times 10 \div 2 = 90$