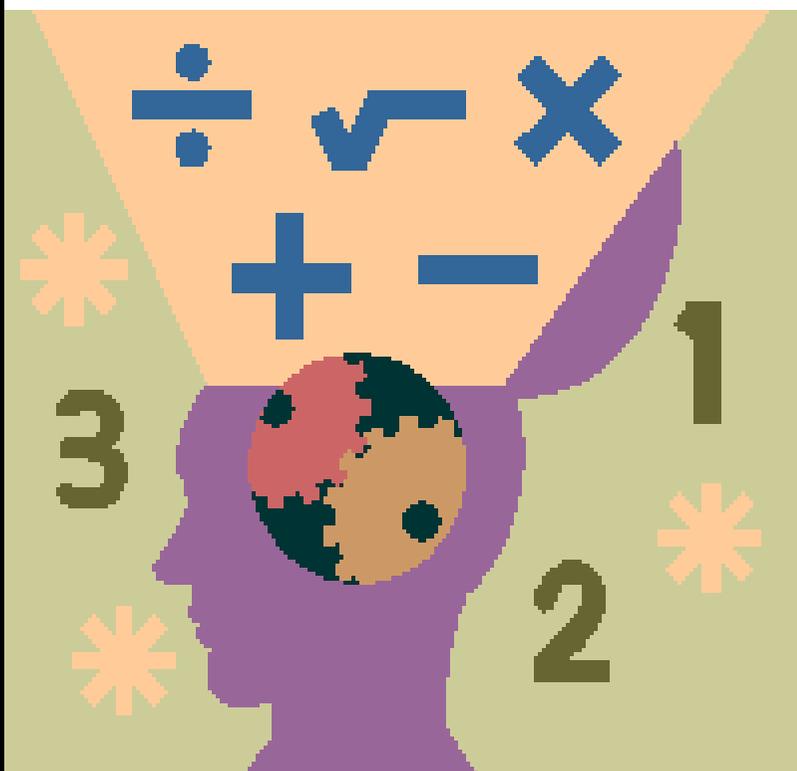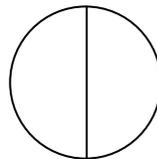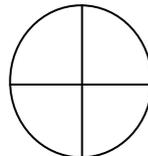# MATHEMATICS

Block 2

2nd Level

FRACTIONS AND PERCENTAGES

Exercise 1

1) The circle is cut into 2 equal parts.
   Each part is one half of the circle

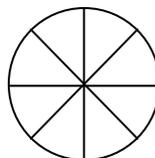   We write $\dfrac{1}{2}$ meaning 1 part out of 2.

   a) This circle is cut into four **equal** parts.
      What fraction of the shape is each part?
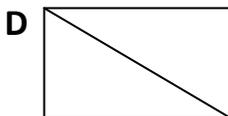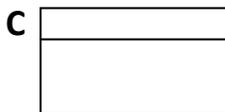
   b) This circle is cut into three equal parts.
      What fraction of the shape is each part?

   c) What fraction of the shape is each part?

2) Write down the letter of the shapes which are cut in half

   A

   B

   C

   D
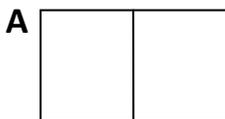
3) Trace these shapes and shade in half.

a)

b)

c)

d)
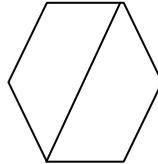
4) Write the letter of the shapes which are cut into quarters.

A
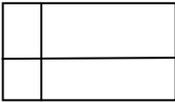
B
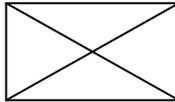
C

D
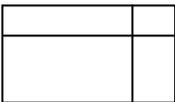
E
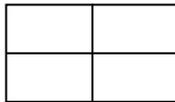
F
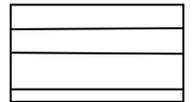
5) Trace the shapes and shade in $\frac{1}{4}$ of each one.

a)
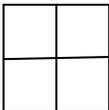
b)
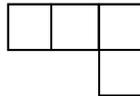
c)
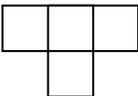
d)
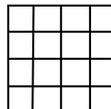
6) Trace each shape and then shade in the fraction given.
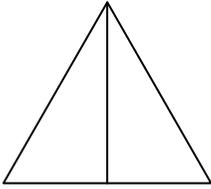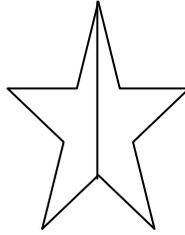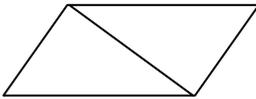
a) $\dfrac{3}{4}$ b) $\dfrac{1}{2}$ c) $\dfrac{5}{6}$

d) $\dfrac{2}{3}$ e) $\dfrac{3}{8}$ f) $\dfrac{4}{5}$
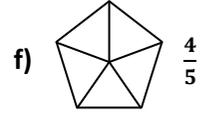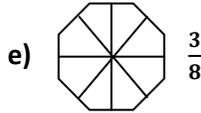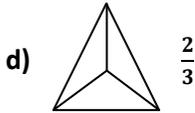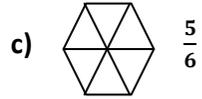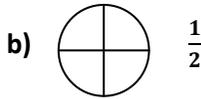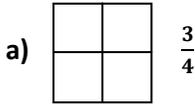
7) A pizza is shared equally among six friends. What fraction does each get?

8) There are seven animals altogether. What fraction are dogs?

9) A bar of chocolate is shared equally among eight friends. What fraction does each get?

10) There are six pieces of fruit in a bowl. What fraction are oranges?

11) In a garden pot there are twenty flowers. Seven are red. What fraction is red?

12) In a class of 25 pupils, six are left handed. What fraction is left handed?

13) What fraction has been shaded?

a)   b)   c)

d)   e)   f)

g)   h)   i)
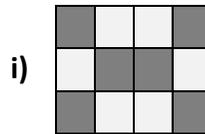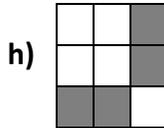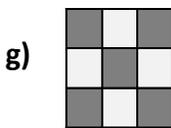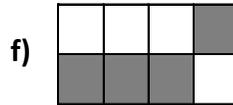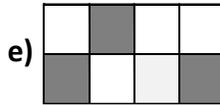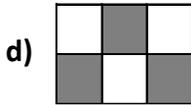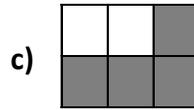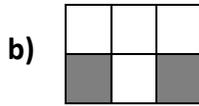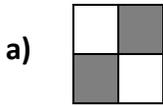
Exercise 2

1) Find

a) $\frac{1}{2}$ of 16   b) $\frac{1}{2}$ of 14   c) $\frac{1}{2}$ of 20   d) $\frac{1}{2}$ of 28

e) $\frac{1}{4}$ of 28   f) $\frac{1}{4}$ of 36   g) $\frac{1}{4}$ of 40   h) $\frac{1}{4}$ of 12

i) $\frac{1}{3}$ of 12   j) $\frac{1}{3}$ of 24   k) $\frac{1}{5}$ of 30   l) $\frac{1}{5}$ of 55

m) $\frac{1}{6}$ of 42   n) $\frac{1}{8}$ of 56   o) $\frac{1}{7}$ of 63   p) $\frac{1}{10}$ of 100

2) Find

a) $\frac{1}{2}$ of 38   b) $\frac{1}{2}$ of 50   c) $\frac{1}{2}$ of 92   d) $\frac{1}{2}$ of 76

e) $\frac{1}{4}$ of 48 **f)** $\frac{1}{4}$ of 52 **g)** $\frac{1}{4}$ of 76 **h)** $\frac{1}{4}$ of 100

i) $\frac{1}{5}$ of 70 **j)** $\frac{1}{7}$ of 91 **k)** $\frac{1}{10}$ of 210 **l)** $\frac{1}{9}$ of 108

m) $\frac{1}{6}$ of 90 **n)** $\frac{1}{8}$ of 112 **o)** $\frac{1}{3}$ of 87 **p)** $\frac{1}{7}$ of 196

3) There are 52 cards in a pack.
One quarter of them are spades.
How many spades are there?

4) Abbi had 50p and spent $\frac{1}{2}$.
How much did she spend?

5) Rosie owns 25 Xbox games. $\frac{1}{5}$ are kept beside the TV.
How many is this?

6) There are 32 pupil in a class. One day there are $\frac{1}{8}$ off.
How many are off?

7) Katie went on holiday for 12 days. It rained for $\frac{1}{3}$. of the time.
How many days did it rain?

8) Jamie is given £1·50 and told he can spend $\frac{1}{3}$ on
sweets. How much did he spend on sweets?

9) Anna was in a queue for a roller coaster. The sign said there was
40 minutes waiting time. She had waited for a fifth of this already.
How long had she waited for?

10) Gavin had 80p.
He spent $\frac{1}{4}$ on sweets and a half of what was left on a drink.
How much did he spend on a drink?

Exercise 3

Write down the equal fractions shown in the following pairs

1)
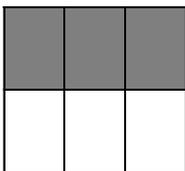
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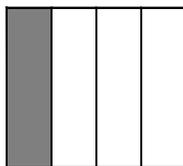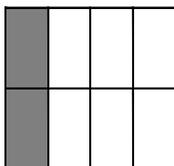
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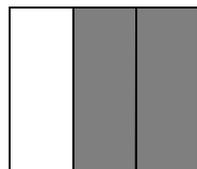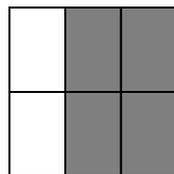
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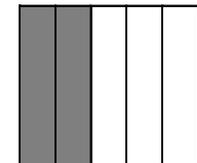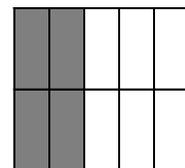
Exercise 4

What fraction is shaded? Answer with as simple a fraction as possible.

1)
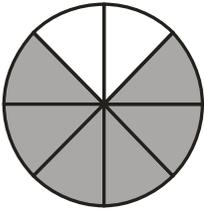
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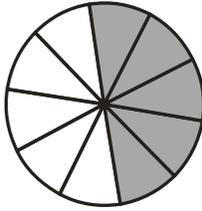
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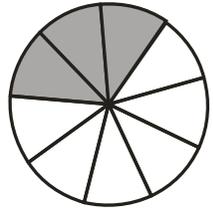
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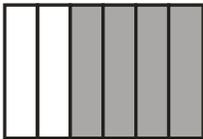
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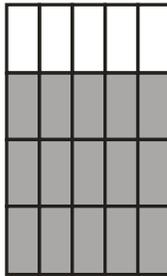
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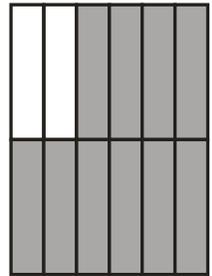
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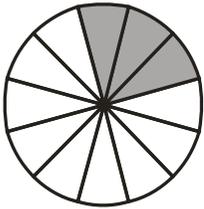
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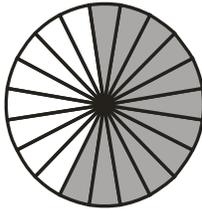
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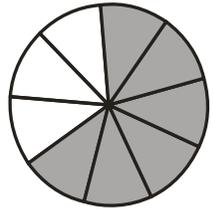
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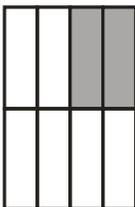
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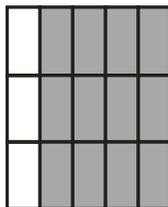
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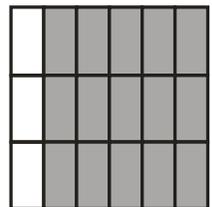
Simplify the following fractions

13) $\frac{4}{8}$ **14)** $\frac{6}{9}$ **15)** $\frac{8}{10}$ **16)** $\frac{3}{6}$

17) $\frac{6}{8}$ **18)** $\frac{8}{12}$ **19)** $\frac{10}{15}$ **20)** $\frac{4}{6}$

Exercise 5

PERCENTAGES, FRACTIONS & DECIMALS

When a quantity is divided into 100 "bits" each bit is called "1 percent".

$$21\% = \frac{21}{100} = 0\cdot21$$

Percentage

Fraction

Decimal
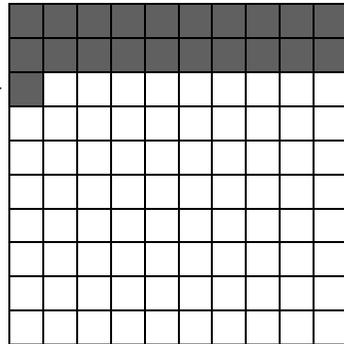
1) Write each percentage as a fraction *and* as a decimal:

   a) 50% **b)** 25% **c)** 75% **d)** 20% **e)** 10%

2) Write the following percentages as fractions:

   a) $33\frac{1}{3}$ % **b)** $66\frac{2}{3}$ % **c)** 40% **d)** 60% **e)** 80%

3) Write each percentage as a fraction *and* as a decimal:

   a) 67% **b)** 29% **c)** 57% **d)** 61% **e)** 37%

   f) 91% **g)** 41% **h)** 11% **i)** 1% **j)** 7%

4) Write each fraction as a percentage *and* as a decimal

a) $\dfrac{33}{100}$ b) $\dfrac{83}{100}$ c) $\dfrac{3}{100}$ d) $\dfrac{17}{100}$

e) $\dfrac{31}{100}$ f) $\dfrac{71}{100}$ g) $\dfrac{9}{100}$ h) $\dfrac{53}{100}$

5) Write each decimal as a fraction **and** as a percentage:

a) 0·63   b) 0·79   c) 0·27   d) 0·19

e) 0·43   f) 0·89   g) 0·51   h) 0·01

NON CALCULATOR PERCENTAGES

Exercise 6

1) Work out:

a) 50% of £84   b) 25% of £1000   c) 20% of £80

d) 10% 0f £40   e) 20% of £6400   f) 33 $\frac{1}{3}$ % of £81

g) 50% of £9   h) 10% of £52   i) 10% of £63

j) 75% of £48   k) 75% of £92   l) 66 $\frac{2}{3}$% of £45

m) 33 $\frac{1}{3}$% of £7.20   n) 66 $\frac{2}{3}$% of £153·60   o) 75% of £61

p) 10% of £15·50   q) 20% of £13·20   r) 10% of 20p

2) A turtle laid 132 eggs. 50% of them were eaten by birds.
How many were eaten by birds?

3) 20% of the pupils in a school are left handed.
If there are 1100 pupils, how many of them are left handed?

4) 25% of the items sold at a car boot sale were CDs.
How many CDs were sold if there were 5400 items?

5) In Glasgow in 2009, it was sunny for 20% of the time.
If there are 365 days in a year, how many days was it sunny for?

CALCULATOR PERCENTAGES

Exercise 7

Calculate:

1) 12% of £600 **2)** 23% of £280 **3)** 36% of £25

4) 28% of £522 **5)** 24% of £16.50 **6)** 19% of £343

7) 57% of £62 **8)** 42% of £812 **9)** 83% of £4100

10) 18% of £94 **11)** 74% of £26 **12)** 14% of £598

13) 82% of £84 **14)** 18% of £22·50 **15)** 12% of £85.50

16) 76% of £55·50 **17)** 92% of £630 **18)** 42% of £720

19) 55% of £682 **20)** 16% of £15 **21)** 6% of £35

22) 8% of £45 **23)** 3% of £150 **24)** 2% of £60

25) 74% of £84 **26)** 36% of £22·50 **27)** 24% of £85·50

28) 34% of £55·50 **29)** 94% of £640 **30)** 35% of £720

31) 26% of £680 **32)** 18% of £25 **33)** 9% of £45

34) 4% of £54   **35)** 2% of £250   **36)** 3% of £90

37) 74% of £58·50   **38)** 82% of £530   **39)** 32% of £420

40) 52% of £662   **41)** 26% of £35   **42)** 8% of £45

43) 7% of £55   **44)** 9% of £170   **45)** 7% of £80

Exercise 8

1) Calculate the sale price of the following items with these **discounts.**

	ITEM	NORMAL PRICE	DISCOUNT
a)	TV	£350	15%
b)	DVD player	£260	65%
c)	Hi-Fi System	£850	30%
d)	Shirt	£35	45%
e)	Ornament	£15·80	25%
f)	Table	£840	15%
g)	Carpet	£688	14%
h)	Fitted Kitchen	£5,800	24%
i)	Magazine	£1·40	20%
j)	Bag of sweets	£1·15	60%
k)	Shoes	£52	5%

2) Calculate the new price of the following items with these **increases.**

	ITEM	COST	INCREASE
a)	Laptop	£400	12%
b)	Camera	£560	35%
c)	Calculator	£12	14%
d)	Playstation	£200	32%
e)	Ornament	£34	26%
f)	Book	£15·50	16%
g)	CD	£12	11%
h)	Jacket	£55	23%

MONEY

Exercise 1

1) How many 1p coins can you get for each of these?

a)   **b)**   **c)**

d)   **e)**

2) How many 2p coins can you get for each of these?

a)   **b)**   **c)**   **d)**

3) How many 5p coins can you get for each of these?

a)   **b)**   **c)**

d)   **e)**

4) How many 10p pieces can you get for each of these?

a)   **b)**

c)   **d)**
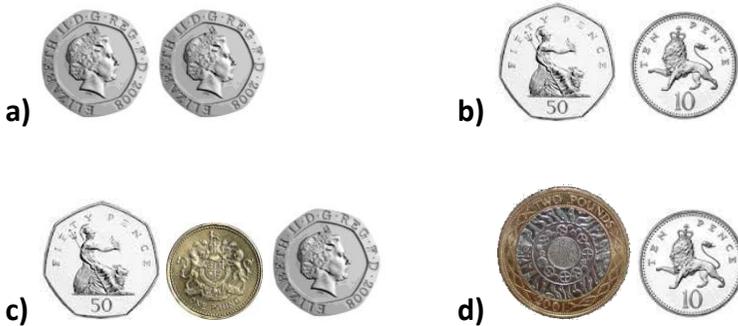
5) Which **two** coins can I use to pay these amounts?

a) 7p	**b)** 12p	**c)** 25p	**d)** 60p
e) 55p	**f)** 30p	**g)** £1·10	**h)** £2·20

6) Anna has 45p in her pocket. She has **three** coins, what are they?

7) Bertie's bus fare must be paid with **exact change.** The fare is 77p. Which **four** coins did he pay with?

Exercise 2

1) Add the following:

    a) 50p + 5p + 2p   **b)** 20p + 20p + 10p   **c)** 50p + 20p + 20p + 10p

2) Add the following:

    a) 50p + 30p   **b)** 24p + 32p   **c)** 55p + 24p **d)** 45p + 39p

    e) 25p + 47p   **f)** 39p + 52p   **g)** 76p + 19p **h)** 17p + 69p

3) Subtract the following:

    a) 78p – 42p   **b)** 87p – 46p   **c)** 59p – 37p **d)** 88p – 55p

    e) 75p – 37p   **f)** 84p – 65p   **g)** 91p – 73p **h)** 33p – 28p

4) Sam buys a drink for 65p and a sweet for 27p.
How much does he pay altogether?

5) John buys a comic for 59p and a bar of chocolate for 35p.
How much does he spend?

6) Ross spend 49p on his bus fare and 45p for a drink.
How much does he spend?

7 Alix handed over a 50p to pay for a bar of chocolate which cost 21p.

How much change should she get?

8) Lucy spent 83p on a sandwich. She paid with a £1 coin.

How much change did she get?

9) Denzel's bus fare was 57p. He paid with a 50p and a 20p.

What change did he get?

10) Gordon bought a magazine. The shopkeeper gave him this change:

He paid with a £1 coin. How much was the magazine?

11) Jackie received   in change.

She paid with a £2 coin. How much did she spend?

Exercise 3

1) How many £1 coin can you exchange for:

a) 300p   **b)** 700p   **c)** 400p   **d)** 900p

2) Write down how many 1p coins can be exchanged for:

a)   **b)**

c)

3) Add the following. Give your answers in pounds and pence.

a) 70p + 70p   **b)** 40p + 90p   **c)** 50p + 70p **d)** 52p + 56p

e) 36p + 85p   **f)** 34p + 96p   **g)** 92p + 79p **h)** 88p + 25p

i) 77p + 85p   **j)** 44p + 136p   **k)** 208p + 316p **l)** 532p + 649p

4) Now try adding these:

a) £1 and 60p + £2 and 30p   **b)** £2 and 20p + £3 and 50p

c) £5 and 20p + £5 and 70p   **d)** £3 and 35p + £2 and 5p

e) £2 and 54p + £4 and 23p   **f)** £7 and 57p + £6 and 19p

5) Craig had lunch in a café.
The, starter was £1 and 25p and the main course was £4 and 65p.
How much did he spend?

6) Add together the following amounts:

a) £3 and 70p + £5 and 30p   **b)** £2 and 80p + £5 and 70p

c) £6 and 90p + £7 and 25p   **d)** £8 and 75p + £4 and 55p

e) £12 and 84p + £2 and 68p   **f)** £15 and 49p + £5 and 74p

7) Jamie went to a restaurant for his dinner.
The main course was £13 and 95p, however he had
to pay extra for a portion of chips at £2 and 45p.
How much did he spend altogether ?

8) Add together these amounts:

a) £4·70 + £6·96   **b)** £7·90 + £5·30

c) £1·80 + £9·59   **d)** £2·35 + £6·85

e) £1·38 + £8·67   **f)** £9·99 + £5·99

g) £10·75 + £1·38   **h)** £23·48 + £16·85

9) Melanie is going to the cinema with her mum. Her ticket costs £5·30
and her mum's £8·75. They also bought popcorn at £2·99.
How much did they spend?

10) Daniel is going swimming with his dad. The cost of an adult ticket is
£3·85 and a child's is £1·99. When they came out they bought two
drinks and some sweets, which came to £4.56.
How much did they spend?

11) Alan's bill at a café came to £3·55.
What change is he due if he paid with £5?

12) Betty's bill was £7·85. She paid with a £10 note.
What change is she due?

13) Caitlin buys a bus ticket at £1·69.
What change would she get from a £2 coin?

14) Daniel 's ticket cost £2·12.
He pays with a £5 note. What should his change be?

15) A toy costs £6·99. Batteries for it cost £2.59.
What change would you get if you paid with a £10 note?

16) Emily buys two CDs costing £10·99 and £7·99.
What change would she get from £20?

17) Francis buys a birthday card for £2·49 and a first class stamp costing
60p. What change would he get from £5?

18) Gail buys a bottle of coke costing £1·58 and a sweet at 78p.
She only has a £10 note. What change does she get?

Exercise 4

1) Abbi buys a car for £1350 and sells it for £1780.
Find the profit she made.

2) Billy bought a house for £51500. Five years later he sold it for
£60000.
Find the profit he made.

3) Caitlin bought a pair of shoes on ebay for £17·99. They didn't fit so
she sold them for £20·45.
Find her profit.

4) Dylan bought a flat at auction for £27600. He sold it a year later for £31495.
What profit did he make?

5) Emily buys an Xbox game in a sale for £15·99. She doesn't like it , but manages to sell it for £20.
Find her profit.

6) Frankie bought a car for £5650. One year later he sold it for £3990.
What loss did he make ?

7) Gemma spent £35 to make cakes for the school fete. However, she only sold cakes to the value of £27·89.
Calculate the loss she made

8) Ian buys a house for £104500. However a year later he loses his job and is forced to sell it for £99950.
What loss did he make?

9) Jackie buys a pair of trainers for £34.99. She then decides she doesn't like them and sells them to her pal for £25.
How much money did she lose?

10) Kevin buys a crate of 12 bottles of coke for £2·40. He only manages to sell 10 of the bottles for 20p each.
What was his loss?

MULTIPLES AND FACTORS

Exercise 1

1) List the first TEN multiples of the following numbers:

   a) 1   **b)** 2   **c)** 3   **d)** 4   **e)** 5

   f) 6   **g)** 7   **h)** 8   **i)** 9   **j)** 10

2) Using your answers to Question 1, write down any common multiples of

   a) 2 and 5   **b)** 4 and 6   **c)** 5 and 9

   d) 6 and 9   **e)** 8 and 10   **f)** 4 and 10

   g) 5 and 8   **h)** 3 and 7   **i)** 2 and 9

   j) 5 and 6

Exercise 2

1) Write down all the multiples of 3 between 1 and 20

2) Write down all the multiples of 5 between 12 and 30

3) Write down all the multiples of 2 between 2 and 50

4) Which of these numbers are multiples of 10

   12, 20, 47, 69, 98, 30, 21, 40, 79, 100, 24, 150

5) Which of these numbers are multiples of 5:

   15, 20, 43, 78, 88, 35, 21, 40, 76, 100, 25, 150

6) What number am I thinking of:

- It is between 20 and 25
- It is a multiple of 3
- It is a multiple of 7

7) What number am I thinking of:

- It is between 11 and 18
- It is a multiple of 3
- It is a multiple of 5

Exercise 3

1) Write down all the ways to make the following numbers by multiplying two numbers together.
   For example   18 = 1x18, 2x9, 3x6

   a) 14 = __x__ , __x__   **b)** 9 = __x__ , __x__

   c) 6 = __x__ , __x__   **d)** 8 = __x__ , __x__

   e) 7 = __x__   **f)** 16 = __x__ , __x__ , __x__

   g) 20 = __x__ , __x__ , __x__   **h)** 12 = __x__ , __x__ , __x__

   i) 30 = __x__ , __x__ , __x__ , __x__
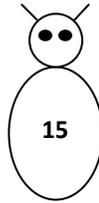
   j) 24 = __x__ , __x__ , __x__ , __x__

Exercise 4

For each 'factor bug' draw as many legs as possible

1) 12

2) 15

3) 20

4) 18

5) 32

6) 5

7) 50

8) 21

9) 48

10) 100

11) 36

12) 24
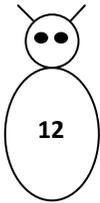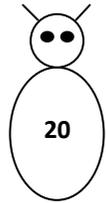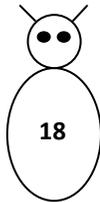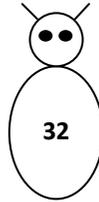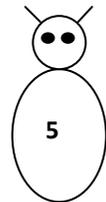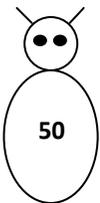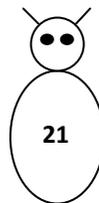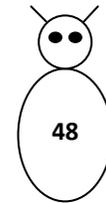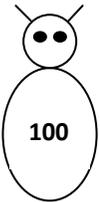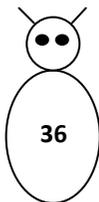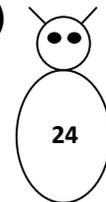
ROUNDING

Exercise 1

1) What number is the arrow nearest to?

a) 10   20

b) 70   80

c) 50   60

d) 30   40
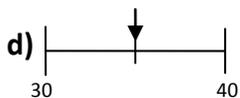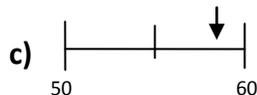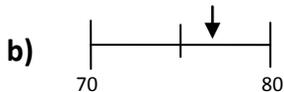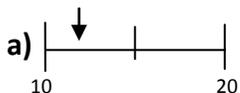
2) Round the following to the nearest 10:

a) 18	**b)** 32	**c)** 41	**d)** 56
e) 37	**f)** 78	**g)** 89	**h)** 65
I) 94	**j)** 67	**k)** 132	**l)** 7
m) 235	**n)** 763	**o)** 981	**p)** 568
q) 321	**r)** 684	**s)** 1587	**t)** 2391
u) 789	**v)** 2059	**w)** 99	**x)** 199
y) 1999	**z)** 1999999		

3) Write all the whole numbers which round to 50.

4) Write all the numbers which round to 120.

Exercise 2

1) What number is the arrow nearest to?
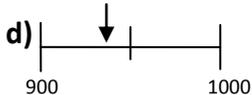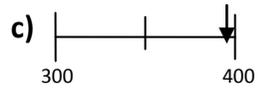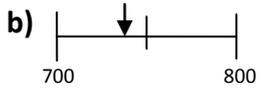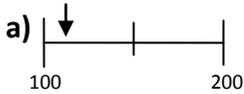
2) Round the following to the nearest 100.

a) 180	**b)** 302	**c)** 341	**d)** 566
e) 437	**f)** 787	**g)** 809	**h)** 685
I) 94	**j)** 67	**k)** 132	**l)** 709
m) 2235	**n)** 1763	**o)** 981	**p)** 9568
q) 321	**r)** 684	**s)** 1587	**t)** 2391
u) 789	**v)** 2059	**w)** 99	**x)** 199
y) 1999	**z)** 1999999		

Exercise 3

1 Round the nearest 1000

a) 1800	**b)** 3200	**c)** 4100	**d)** 5600
e) 3070	**f)** 7805	**g)** 8099	**h)** 6500
i) 6094	**j)** 6970	**k)** 1032	**l)** 7006
m) 2305	**n)** 7603	**o)** 9081	**p)** 5680
q) 3261	**r)** 6284	**s)** 19587	**t)** 20391
u) 789	**v)** 2059	**w)** 9090	**x)** 1909
y) 1999	**z)** 1999999		

Exercise 4

1) Round the following numbers correct to the **nearest whole number**.

a) 15·32	**b)** 327·8	**c)** 59·52	**d)** 738·29
e) 826·192	**f)** 1234·5	**g)** 987·65	**h)** 13·84
i) 7·532	**j)** 123·45	**k)** 43·34	**l)** 152·4
m) 246·82	**n)** 38·25	**o)** 49·18	**p)** 99·08
q) 99·8	**r)** 1·234	**s)** 0·82	**t)** 3842·7

Exercise 5

1) Here is a list of the record average attendance to a match in each of Europe's top football leagues.
Round each attendance to the nearest thousand.

a) Premiership ╬ England 34,780

b) Bundesliga 🇩🇪 Germany 42,565

c) La Liga 🇪🇸 Spain 29,124

d) Championship ╬ England 18,106

e) Serie A 🇮🇹 Italy 25,304

f) Ligue 1 🇫🇷 France 24,050

2) Anna is going to ten concerts this year. Here are the prices of her tickets.
Round each price to the nearest ten pounds.

a) Oasis £42   f) T in the Park £224

b) Lady Gaga £67   g) Editors £23

c) Eminem £56   h) REM £63

d) Pink £54   i) Snow Patrol £25

e) Beyonce £45   j) Rolling Stones £108

3) There are eight children in a hospital ward. The nurse weighed them. Each child's weight is shown below.
Round each weight to the nearest whole kilogram.

a) James   24·3 kg   **e)** Callum   31·6 kg

b) Amber   14·2 kg   **f)** Claire   19·8 kg

c) Leon   22·53 kg   **g)** Bobby   17.35 kg

d) Rachel   14·812 kg   **h)** Susan   34·486 kg

4) One week a holiday resort had 1568 guests staying.

Round this number to the nearest hundred.

5) 8432 cars used a bridge over the period of one hour.

Round this number to the nearest ten.

6) Marco got his height measured. He measured 153·72cm.

Round his height to the nearest whole number.

7) There were 54,476 people staying in a town.

Round this population to the nearest thousand.