

# MATHEMATICS



Block 2



3rd Level

# Multiples, Factors, Primes and Powers

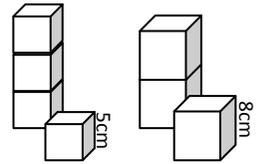
## Exercise 1 (A)

- 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 From 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

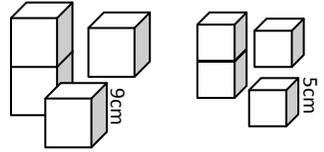
## Exercise 1 (B)

- 1
  - a At a disco, the **red light** comes on **every 4 seconds**, the blue light comes on every 6 seconds and the yellow light every 9 seconds. If they are all switched on at the same time, how long will it be before all 3 lights are on together again?
  - b At a disco, the red light comes on every 2 seconds, the blue light comes on every 3 seconds and the yellow light every 4 seconds. If they are all switched on at the same time, how long will it be before all 3 lights are on together again?
  - c At a disco, the red light comes on every 4 seconds, the blue light comes on every 5 seconds and the yellow light every 8 seconds. If they are all switched on at the same time, how long will it be before all 3 lights are on together again?
  - d At a disco, the red light comes on every 3 seconds, the blue light comes on every 5 seconds and the yellow light every 6 seconds. If they are all switched on at the same time, how long will it be before all 3 lights are on together again?

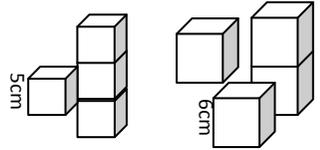
- 2 a Jack builds a tower using 5cm cubes and a tower using 8cm cubes. At what height will both towers first be the same height? How many 5cm cubes and how many 8cm cubes are there in the towers?



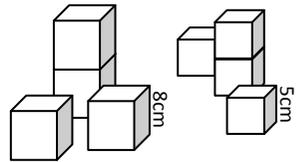
- b Jack builds a tower using 9cm cubes and a tower using 5cm cubes. At what height will both towers first be the same height? How many 9cm cubes and how many 5cm cubes are there in the towers?



- c Jack builds a tower using 5cm cubes and a tower using 6cm cubes. At what height will both towers first be the same height? How many 5cm cubes and how many 6cm cubes are there in the towers?



- d Jack builds a tower using 8cm cubes and a tower using 6cm cubes. At what height will both towers first be the same height? How many 8cm cubes and how many 6cm cubes are there in the towers?



## Exercise 1 (C)

- 1 Identify the **Lowest Common Multiples** of the following numbers
- |              |             |             |             |
|--------------|-------------|-------------|-------------|
| a 3 and 4    | b 5 and 6   | c 6 and 8   | d 7 and 5   |
| e 6 and 12   | f 4 and 9   | g 14 and 8  | h 10 and 6  |
| i 20 and 15  | j 18 and 12 | k 30 and 12 | l 35 and 14 |
| m 4,6 and 10 | n 5,6 and 8 | o 2,7 and 9 | p 3,4 and 5 |

## Exercise 2 (A)

- 1 Write down all the ways to make the following numbers by multiplying two numbers together.

For example-  $18 = 1 \times 18, 2 \times 9, 3 \times 6$

**a** 12      **b** 9      **c** 6      **d** 8      **e** 7      **f** 16  
**g** 20      **h** 24      **i** 30      **j** 14      **k** 36      **l** 40  
**m** 35      **n** 32      **o** 45      **p** 72      **q** 54      **r** 81

## Exercise 2 (B)

- 1 Write down all the factors of the following number.

For example the factors of 18 are 1,2,3,6,9,18.

**a** 4      **b** 15      **c** 10      **d** 8      **e** 11      **f** 14  
**g** 28      **h** 16      **i** 21      **j** 36      **k** 42      **l** 30  
**m** 50      **n** 44      **o** 80      **p** 90      **q** 100      **r** 150

- 2 Write down any common factors of the following numbers and circle the highest common factor

**a** 4, 8      **b** 3, 6      **c** 9, 12      **d** 8, 12      **e** 5, 20      **f** 10, 15  
**g** 18,30      **h** 14,21      **i** 24,32      **j** 36,27      **k** 40,16      **l** 24, 36  
**m** 40,70      **n** 54,24      **o** 35,25      **p** 14,49      **q** 72,54      **r** 99,66

## Exercise 2 (C)

- 1 State the highest common factor of the following numbers

**a** 25,45      **b** 16,56      **c** 4,12      **d** 35,14      **e** 24,40      **f** 30,70  
**g** 27,30      **h** 24,36      **i** 75, 100      **j** 160, 200      **k** 132, 144      **l** 160, 220  
**m** 30, 36, 48      **n** 14, 42, 49      **o** 27, 54, 63      **p** 30, 45, 55      **q** 12, 32, 40      **r** 8, 32, 36

## Exercise 3 (B)

- 1 Investigate the factors of the following numbers.

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37

What do you notice?

What name do we give to these types of numbers?

- 2 Investigate the factors of the following numbers.

1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144

What do you notice?

What name do we give to these types of numbers?

## Exercise 4 (B)

- 1 Do the following on the Prime Numbers worksheet

- Colour in all the multiples of 2
- Colour in all the multiples of 3
- Colour in all the multiples of 5 (Why not 4?)
- Carry on for all the numbers up to 10

What do you notice about the numbers which are left?

- 2 List all the prime numbers from 1 to 100
- 3 Using your answer to question 2, answer the following questions:
- a What is the only even prime number? Why is this?
  - b What is the first prime number bigger than 20?
  - c How many prime numbers are there between 1 and 100?
  - d Why is 1 not a prime number?
- 4 Investigate the patterns that prime numbers make when plotted on different sized grids. (Could be done at home)

## Exercise 5 (B)

1 Write down the working and answers to the following questions

a  $1^2$       b  $2^2$       c  $3^2$       d  $4^2$       e  $5^2$       f  $6^2$   
g  $7^2$       h  $8^2$       i  $9^2$       j  $10^2$       k  $11^2$       l  $12^2$

## Exercise 5 (C)

1 Write down the working and answers to the following questions

a  $0.4^2$       b  $0.2^2$       c  $1.2^2$       d  $0.9^2$       e  $0.05^2$       f  $0.03^2$   
g  $20^2$       h  $70^2$       i  $300^2$       j  $500^2$       k  $6000^2$       l  $8000^2$   
m  $32^2$       n  $75^2$       o  $21^2$       p  $73^2$       q  $814^2$       r  $537^2$   
s  $0.1^2$       t  $60^2$       u  $900^2$       v  $52^2$       w  $39^2$       x  $147^2$

2 a Copy and complete this pattern for the first ten rows:

$$\begin{array}{r} 1 + 3 = 4 \\ 3 + 6 = \\ 6 + 10 = \\ 10 + 15 = \end{array}$$

b What do you notice about the right hand column?

## Exercise 6 (B)

1 Write down the working and answers to the following questions

a  $2^3$       b  $3^3$       c  $4^3$       d  $5^3$       e  $6^3$       f  $7^3$   
g  $8^3$       h  $9^3$       i  $10^3$       j  $2^4$       k  $3^4$       l  $4^4$

## Exercise 6 (C)

1 Write down the working and answers to the following questions

a  $2^5$       b  $3^5$       c  $6^5$       d  $3^6$       e  $9^3$       f  $7^4$   
g  $0.2^3$       h  $0.4^3$       i  $0.3^4$       j  $0.05^3$       k  $20^3$       l  $40^3$   
m  $8^5$       n  $2^9$       o  $0.5^4$       p  $10^6$       q  $25^3$       r  $16^4$

# Rounding

## Exercise 1 (A)

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

- 1) 15.32   2) 327.8   3) 59.52   4) 738.29   5) 826.192   6) 1234.5  
7) 987.65   8) 13.84   9) 7.532   10) 123.45   11) 43.34   12) 152.4  
13) 246.82   14) 38.25   15) 49.18   16) 99.08   17) 99.8   18) 1.234  
19) 0.82   20) 3842.7

Round the following numbers to the **nearest ten**.

- 21) 43   22) 53   23) 74   24) 79   25) 86   26) 35  
27) 48   28) 23   29) 123   30) 342   31) 346   32) 519  
33) 876   34) 753   35) 835   36) 93   37) 99   38) 222  
39) 666   40) 185

Round the following numbers to the **nearest hundred**.

- 41) 326   42) 732   43) 782   44) 150   45) 649   46) 531  
47) 282   48) 934   49) 981   50) 3246   51) 7813   52) 7884  
53) 8591   54) 6184   55) 8342   56) 2345   57) 3456   58) 23826  
59) 72173   60) 94382

Round the following numbers to the **nearest thousand**.

- 61) 8100   62) 5820   63) 2426   64) 3529   65) 23820   66) 44400  
67) 55500   68) 66770   69) 12345   70) 98765   71) 19384   72) 23824  
73) 61800   74) 37342   75) 39684   76) 53412   77) 84500   78) 15420  
79) 99312   80) 99684

## Exercise 1 (B)

Round the following numbers correct to **1 decimal place**.

- 1) 8.43    2) 5.76    3) 2.39    4) 5.24    5) 3.18    6) 12.49  
7) 11.02    8) 11.05    9) 23.81    10) 72.46    11) 93.55    12) 82.43  
13) 7.98    14) 8.329    15) 6.483    16) 9.876    17) 12.345    18) 135.69

Round the following numbers correct to **2 decimal places**.

- 19) 5.382    20) 2.846    21) 9.305    22) 9.304    23) 7.826    24) 8.537  
25) 6.692    26) 6.698    27) 13.492    28) 15.328    29) 43.135    30) 9.876  
31) 12.345    32) 23.456    33) 33.333    34) 5.555    35) 3.8028    36) 472.3192

Round the following numbers correct to **3 decimal places**.

- 37) 8.4127    38) 5.3841    39) 2.9235    40) 7.1472    41) 9.1833    42) 16.5308  
43) 6.5304    44) 3.4592    45) 3.4595  
46) 123.4567    47) 98.7654    48) 135.1357  
49) 1.234567    50) 7.6382835

Round the following numbers correct to the **number of decimal places indicated**.

- 51) 14.3827 (3dp)    52) 14.3827 (2dp)    53) 14.3827 (1dp)    54) 6.8025 (3dp)  
55) 6.8025 (2dp)    56) 6.8025 (1dp)    57) 23.4723 (1dp)    58) 0.81607 (2dp)  
59) 9.0869 (2dp)    60) 9.0869 (1dp)    61) 27.492 (2dp)    62) 27.498 (2dp)  
63) 2.34567 (4dp)    64) 2.34567 (1dp)    65) 6.9025 (3dp)    66) 0.020487 (2dp)  
67) 0.020487 (4dp)    68) 2.46883 (3dp)    69) 9.8124 (3dp)    70) 784.193 (1dp)  
71) 0.00605 (4dp)    72) 0.02189 (2dp)    73) 0.39872 (2dp)    74) 643.718 (2dp)  
75) 8.99954 (3dp)    76) 7.1842 (3dp)    77) 188.448 (2dp)    78) 13.9951 (2dp)  
79) 100.002 (2dp)    80) 73.91987 (3dp)

## Exercise 1 (C)

Round the following correct to **the stated number of significant figures**.

- |                     |                     |                    |
|---------------------|---------------------|--------------------|
| 1) 66·3082 (5sf)    | 2) 66·3082 (4sf)    | 3) 66·3082 (3sf)   |
| 4) 66·3082 (2sf)    | 5) 66·3082 (1sf)    | 6) 0·008047 (3sf)  |
| 7) 0·008047 (2sf)   | 8) 0·008047 (1sf)   | 9) 0·487 (2sf)     |
| 10) 2·487 (2sf)     | 11) 2·987 (3sf)     | 12) 2·987 (2sf)    |
| 13) 2·987 (1sf)     | 14) 0·020487 (4sf)  | 15) 0·020487 (3sf) |
| 16) 0·020487 (2sf)  | 17) 0·020487 (1sf)  | 18) 2468·83 (5sf)  |
| 19) 2468·43 (4sf)   | 20) 2468·43 (3sf)   | 21) 2468·43 (2sf)  |
| 22) 2468·43 (1sf)   | 23) 876 (2sf)       | 24) 698 (2sf)      |
| 25) 698 (1sf)       | 26) 32650·04 (3sf)  | 27) 298·24 (2sf)   |
| 28) 24875·21 (3sf)  | 29) 0·054057 (3sf)  | 30) 0·405784 (4sf) |
| 31) 154·02581 (5sf) | 32) 32545252 (2sf)  | 33) 258·154 (4sf)  |
| 34) 5124·025 (1sf)  | 35) 0·002524 (1sf)  | 36) 0·002524 (2sf) |
| 37) 25·00145 (3sf)  | 38) 652·0221 (4sf)  | 39) 652·0821 (4sf) |
| 40) 5540·3285 (2sf) | 41) 0·0002055 (2sf) | 42) 2·005467 (5sf) |
| 43) 0·5126 (3sf)    | 44) 5·821 (2sf)     | 45) 65·89 (2sf)    |
| 46) 587·55 (4sf)    | 47) 0·581 (1sf)     | 48) 0·0713 (1sf)   |
| 49) 5·8354 (3sf)    | 50) 87·84 (2sf)     | 51) 2482 (2sf)     |
| 52) 52666 (3sf)     | 53) 6·851 (1sf)     | 54) 0·3142 (1sf)   |
| 55) 5240 (1sf)      | 56) 34·62 (3sf)     | 57) 63840 (3sf)    |
| 58) 0·0574 (2sf)    | 59) 0·0333 (1sf)    | 60) 115·62 (3sf)   |
| 61) 84888 (2sf)     | 62) 5·0071 (3sf)    | 63) 5·0063 (3sf)   |
| 64) 18·195 (2sf)    | 65) 3·4961 (3sf)    | 66) 21·982 (3sf)   |
| 67) 9·642 (1sf)     | 68) 0·7975 (2sf)    | 69) 3·982 (2sf)    |
| 70) 7·981 (2sf)     | 71) 3·296 (3sf)     | 72) 83·82 (1sf)    |

## Exercise 1 (B)

- 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
- b) Lady Gaga £67
- c) Eminem £56
- d) Pink £54
- e) Beyonce £45
- f) T in the Park £224
- g) Editors £23
- h) REM £63
- i) Snow Patrol £25
- 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 24.3kg
- b) Amber 14.2kg
- c) Leon 22.53kg
- d) Rachel 14.812kg
- e) Callum 31.6kg
- f) Claire 19.8kg
- g) Bobby 17.35kg
- h) Susan 34.486kg

- 4) Auntie Betty decorates cakes for a living. She has six pieces of ribbon of various colours and lengths. Round each length to one decimal place.
- |           |          |          |          |
|-----------|----------|----------|----------|
| a) Red    | 18.34cm  | b) White | 34.72cm  |
| c) Yellow | 26.47cm  | d) Green | 9.783cm  |
| e) Blue   | 42.612cm | f) Pink  | 12.973cm |
- 5) Steve managed to jump 3.2674m in the long jump. Round this distance to two decimal places.
- 6) One week a holiday resort had 1568 guests staying. Round this number to the nearest hundred.
- 7) During a survey of the car usage of the Forth Road Bridge it was recorded that 8432 cars used the bridge over the period of one hour. Round this number to the nearest ten.
- 8) Marco went for a health check and got his height measured. He measured 153.72cm. Round his height to the nearest whole number.
- 9) In a census, it was discovered that there were 54,476 people staying in Aberlady. Round this population to the nearest thousand.
- 10) George is a gardener. He bought a bag of soil which contained  $645.437\text{cm}^3$ . Round this volume to one decimal place.

# Decimals

## Exercise 1 (A)

Arrange these decimals in order of size starting with the smallest

- 1) 0.3      0.7      0.1
- 2) 0.9      0.5      0.3
- 3) 0.27      0.19      0.81      0.99
- 4) 0.03      0.07      0.01      0.123
- 5) 0.361      0.729      0.887      0.039
- 6) 0.013      0.061      0.011      0.087
- 7) 0.009      0.007      0.001      0.141
- 8) 0.201      0.211      0.300      0.199
- 9) 0.567      0.581      0.509      0.500
- 10) 0.345      0.476      0.225      0.599

## Exercise 1 (B)

Arrange these decimals in order of size starting with the smallest

- 1) 0.4, 0.5, 0.2
- 2) 0.50, 0.08, 0.8
- 3) 0.70, 0.68, 0.73
- 4) 0.42, 0.48, 0.51
- 5) 0.3, 0.6, 0.4
- 6) 0.38, 0.52, 0.44
- 7) 0.81, 0.4, 0.6
- 8) 0.22, 0.89, 0.5
- 9) 0.73, 0.9, 0.7
- 10) 0.4, 0.38, 0.2
- 11) 0.5, 0.27, 0.72
- 12) 0.3, 2.1, 0.7
- 13) 0.42, 4.2, 0.24
- 14) 0.4, 0.24, 0.42
- 15) 5.2, 0.52, 0.25
- 16) 0.3, 0.33, 0.2
- 17) 0.4, 0.44, 4.4
- 18) 0.8, 8.8, 0.88
- 19) 0.5, 0.45, 0.54
- 20) 0.81, 0.58, 0.85

## Exercise 1 (C)

- 1) The time given for each dog in a greyhound race is given in the table.

Slippy Sam was last (6<sup>th</sup>) because he had the slowest time

Write down the finishing positions of each dog.

<b>DOG</b>	<b>TIME (seconds)</b>	<b>FINISHING POSITION</b>
Geordie	42·05	
Slowboat	41·50	
Laxdale Lass	41·18	
Slippy Sam	43·92	6 <sup>th</sup>
Black Leg	42·64	
Bruce	41·93	

- 2) The time given for each dog in a greyhound race is given in the table.

Write down the finishing positions of each dog.

<b>DOG</b>	<b>TIME (seconds)</b>	<b>FINISHING POSITION</b>
Muzzle Mincer	37·85	
Price's Right	38·41	
Melanie Mine	37·57	
Cat Cruncher	38·03	
Blinker II	37·28	
Dream Song	36·99	

3) Write down the finishing positions of each dog.

<b>DOG</b>	<b>TIME (seconds)</b>	<b>FINISHING POSITION</b>
Drumstick	39·20	
Hot Dog III	37·84	
Marginal Run	38·05	
Roustabout	37·55	
Toffee Apple	37·79	
Burnt Ember	37·43	

4) Write down the finishing positions of each dog.

<b>DOG</b>	<b>TIME (seconds)</b>	<b>FINISHING POSITION</b>
Rabbit Warren	38·77	
Muncher	39·01	
Stroll On	38·55	
Bone Idle	38·78	
Gypsy Girl	38·08	
Best Friend	38·51	

5) Write down the finishing positions of each dog.

<b>DOG</b>	<b>TIME (seconds)</b>	<b>FINISHING POSITION</b>
The Wag	38·95	
Rustler	40·04	
Mint	38·80	
Bootleg	38·09	
Dog Collar	40·71	
Early Bird	38·84	

## Exercise 2(A) Add

- |     |                                 |     |                                 |     |                                 |
|-----|---------------------------------|-----|---------------------------------|-----|---------------------------------|
| 1)  | $1\cdot14$<br>$+ 2\cdot30$<br>. | 2)  | $4\cdot03$<br>$+ 5\cdot81$<br>. | 3)  | $6\cdot14$<br>$+ 2\cdot35$<br>. |
| 4)  | $4\cdot31$<br>$+ 4\cdot58$<br>. | 5)  | $2\cdot25$<br>$+ 3\cdot46$<br>. | 6)  | $7\cdot36$<br>$+ 1\cdot37$<br>. |
| 7)  | $4\cdot72$<br>$+ 2\cdot83$<br>. | 8)  | $4\cdot81$<br>$+ 3\cdot45$<br>. | 9)  | $6\cdot24$<br>$+ 3\cdot88$<br>. |
| 10) | $3\cdot86$<br>$+ 5\cdot79$<br>. | 11) | $7\cdot99$<br>$+ 1\cdot77$<br>. | 12) | $6\cdot87$<br>$+ 2\cdot78$<br>. |
| 13) | $7\cdot83$<br>$+ 5\cdot92$<br>. | 14) | $8\cdot47$<br>$+ 6\cdot54$<br>. | 15) | $9\cdot86$<br>$+ 6\cdot97$<br>. |

## Exercise 2(B) Add

- |     |  |     |  |     |  |
|-----|--|-----|--|-----|--|
| 1)  | $2\cdot1$<br>$3\cdot4$<br>$+ 6\cdot2$    | 2)  | $0\cdot3$<br>$4\cdot2$<br>$+ 2\cdot4$    | 3)  | $1\cdot6$<br>$2\cdot0$<br>$+ 3\cdot2$    |
| 4)  | $4\cdot0$<br>$0\cdot5$<br>$+ 2\cdot3$    | 5)  | $4\cdot2$<br>$6\cdot4$<br>$+ 5\cdot8$    | 6)  | $5\cdot6$<br>$6\cdot5$<br>$+ 4\cdot8$    |
| 7)  | $3\cdot7$<br>$6\cdot4$<br>$+ 8\cdot5$    | 8)  | $7\cdot9$<br>$2\cdot8$<br>$+ 3\cdot7$    | 9)  | $7\cdot03$<br>$2\cdot58$<br>$+ 5\cdot64$ |
| 10) | $6\cdot56$<br>$4\cdot84$<br>$+ 7\cdot71$ | 11) | $7\cdot07$<br>$8\cdot56$<br>$+ 3\cdot70$ | 12) | $4\cdot28$<br>$8\cdot27$<br>$+ 7\cdot65$ |

- 13)**  $15\cdot47$   
 $3\cdot08$   
 $+ 14\cdot88$
- 14)**  $33\cdot77$   
 $28\cdot52$   
 $+ 13\cdot49$
- 15)**  $72\cdot82$   
 $49\cdot56$   
 $+ 18\cdot81$
- 16)**  $15 + 3\cdot4$
- 17)**  $13 + 2\cdot53$
- 18)** Add  $0\cdot68$  to  $1\cdot7$
- 19)** Add  $3\cdot28$  and  $14\cdot02$
- 20)** Add  $7\cdot9$ ,  $4$  and  $3\cdot72$
- 21)**  $7\cdot9 + 0\cdot62 + 5$
- 22)** Add  $8\cdot6$ ,  $5$  and  $3\cdot21$
- 23)** Two tables are placed together to form a larger one. The first table is  $67\cdot4$  cm long and the second table is  $56\cdot8$  cm long. What is the total length?
- 24)** Three boxes weigh  $4\cdot6$  kg,  $7\cdot9$  kg and  $18\cdot2$  kg. What is the total weight?
- 25)** What length of shelf is needed to hold books with thicknesses of  $6\cdot3$  cm,  $7\cdot4$  cm,  $1\cdot8$  cm,  $2\cdot8$  cm and  $4\cdot9$  cm?
- 26)** John weighs  $45\cdot2$  kg and Allan weighs  $40$ kg. What is their total weight?

## Exercise 2(C)

Work out the answers to each of the following:-

- 1)**  $7\cdot2 + 3\cdot6$
- 2)**  $5\cdot7 + 4\cdot5$
- 3)**  $12\cdot3 + 17\cdot8$
- 4)**  $16\cdot5 + 14\cdot2$
- 5)**  $1\cdot4 + 2\cdot7$
- 6)**  $4\cdot28 + 2\cdot15$
- 7)**  $4\cdot17 + 3\cdot69$
- 8)**  $5\cdot22 + 1\cdot79$
- 9)**  $3\cdot58 + 2\cdot19$
- 10)**  $1\cdot11 + 6\cdot66$
- 11)**  $4 + 3\cdot6$
- 12)**  $12 + 4\cdot2$
- 13)**  $13\cdot8 + 1\cdot7$
- 14)**  $56\cdot1 + 3\cdot46$
- 15)**  $17\cdot1 + 2\cdot83$
- 16)**  $1\cdot7 + 2\cdot57$
- 17)**  $12\cdot6 + 1\cdot47$
- 18)**  $14 + 0\cdot29$
- 19)**  $15 + 3\cdot42$
- 20)**  $13 + 2\cdot53$
- 21)** Add  $0\cdot68$  to  $1\cdot7$
- 22)** Find the sum of  $3\cdot28$  and  $14\cdot02$
- 23)** To  $7\cdot9$  add  $4$  and  $3\cdot72$
- 24)** Evaluate  $7\cdot9 + 0\cdot62 + 5$
- 25)** Find the sum of  $8\cdot6$ ,  $5$  and  $3\cdot21$

### Exercise 3(A) Subtract

- |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|
| 1)  | $\begin{array}{r} 27\cdot58 \\ - 13\cdot27 \\ \hline \end{array}$ | 2)  | $\begin{array}{r} 38\cdot69 \\ - 10\cdot18 \\ \hline \end{array}$ | 3)  | $\begin{array}{r} 42\cdot22 \\ - 1\cdot02 \\ \hline \end{array}$  |
| 4)  | $\begin{array}{r} 29\cdot56 \\ - 3\cdot16 \\ \hline \end{array}$  | 5)  | $\begin{array}{r} 75\cdot59 \\ - 23\cdot28 \\ \hline \end{array}$ | 6)  | $\begin{array}{r} 68\cdot88 \\ - 2\cdot06 \\ \hline \end{array}$  |
| 7)  | $\begin{array}{r} 82\cdot73 \\ - 0\cdot22 \\ \hline \end{array}$  | 8)  | $\begin{array}{r} 55\cdot79 \\ - 23\cdot01 \\ \hline \end{array}$ | 9)  | $\begin{array}{r} 82\cdot38 \\ - 0\cdot11 \\ \hline \end{array}$  |
| 10) | $\begin{array}{r} 99\cdot19 \\ - 18\cdot19 \\ \hline \end{array}$ | 11) | $\begin{array}{r} 75\cdot46 \\ - 12\cdot12 \\ \hline \end{array}$ | 12) | $\begin{array}{r} 38\cdot67 \\ - 18\cdot17 \\ \hline \end{array}$ |
| 13) | $\begin{array}{r} 38\cdot67 \\ - 5\cdot06 \\ \hline \end{array}$  | 14) | $\begin{array}{r} 28\cdot46 \\ - 12\cdot58 \\ \hline \end{array}$ | 15) | $\begin{array}{r} 99\cdot88 \\ - 7\cdot89 \\ \hline \end{array}$  |

### Exercise 3 (B) Subtract

Work out the answers to each of the following:

- |     |  |     |                                     |     |                         |
|-----|--|-----|-------------------------------------|-----|-------------------------|
| 1)  | $6\cdot8 - 4\cdot3$  | 2)  | $9\cdot6 - 1\cdot8$                 | 3)  | $32\cdot7 - 14\cdot2$   |
| 4)  | $15\cdot6 - 14\cdot7$  | 5)  | $26\cdot9 - 12\cdot4$               | 6)  | $17\cdot28 - 10\cdot43$ |
| 7)  | $56\cdot48 - 25\cdot29$                                      | 8)  | $82\cdot04 - 63\cdot48$             | 9)  | $92\cdot16 - 25\cdot31$ |
| 10) | $83\cdot58 - 36\cdot21$                                      | 11) | $25\cdot83 - 15\cdot4$              | 12) | $36\cdot42 - 15\cdot9$  |
| 13) | $83\cdot29 - 16\cdot3$                                       | 14) | $25\cdot62 - 7\cdot3$               | 15) | $34\cdot26 - 1\cdot09$  |
| 16) | $26\cdot4 - 15\cdot35$                                       | 17) | $12\cdot4 - 5\cdot62$               | 18) | $17\cdot4 - 8\cdot99$   |
| 19) | $34\cdot6 - 2\cdot11$  | 20) | $73\cdot2 - 16\cdot78$              | 21) | $14 - 3\cdot2$          |
| 22) | $83 - 5\cdot6$   | 23) | $46 - 3\cdot7$                      | 24) | $36 - 8\cdot08$         |
| 25) | $42 - 6\cdot72$  |     |                                     |     |                         |
| 26) | Take $19\cdot2$ from $76\cdot8$                              | 27) | From $0\cdot67$ subtract $0\cdot38$ |     |                         |
| 28) | Subtract $1\cdot9$ from $10\cdot2$                           | 29) | Evaluate $7\cdot62 - 0\cdot81$      |     |                         |
| 30) | What is the difference between $17\cdot93$ and $13\cdot27$ ? |     |                                     |     |                         |

## Exercise 4 (A) Multiply

- |                            |                            |                            |
|----------------------------|----------------------------|----------------------------|
| 1) $16 \cdot 3 \times 6$   | 2) $29 \cdot 4 \times 7$   | 3) $38 \cdot 6 \times 2$   |
| 4) $29 \cdot 3 \times 4$   | 5) $51 \cdot 6 \times 2$   | 6) $29 \cdot 7 \times 3$   |
| 7) $23 \cdot 8 \times 9$   | 8) $14 \cdot 81 \times 5$  | 9) $29 \cdot 31 \times 3$  |
| 10) $93 \cdot 37 \times 7$ | 11) $18 \cdot 81 \times 5$ | 12) $38 \cdot 72 \times 4$ |
| 13) $29 \cdot 9 \times 6$  | 14) $17 \cdot 81 \times 8$ | 15) $14 \cdot 93 \times 9$ |
| 16) $83 \cdot 8 \times 8$  | 17) $56 \cdot 92 \times 4$ | 18) $73 \cdot 24 \times 5$ |
| 19) $9 \cdot 49 \times 9$  | 20) $92 \cdot 01 \times 7$ | 21) $15 \times 8$          |
| 22) $7 \cdot 42 \times 6$  | 23) $28 \cdot 39 \times 5$ | 24) $60 \cdot 02 \times 9$ |

## Exercise 4 (B) Multiply

- |                               |                               |                               |
|-------------------------------|-------------------------------|-------------------------------|
| 1) $4 \cdot 2 \times 10$      | 2) $7 \cdot 3 \times 10$      | 3) $2 \cdot 8 \times 10$      |
| 4) $14 \cdot 3 \times 10$     | 5) $17 \cdot 28 \times 10$    | 6) $18 \cdot 29 \times 10$    |
| 7) $38 \cdot 35 \times 10$    | 8) $42 \cdot 02 \times 10$    | 9) $3 \cdot 1 \times 100$     |
| 10) $6 \cdot 7 \times 100$    | 11) $4 \cdot 3 \times 100$    | 12) $7 \cdot 9 \times 100$    |
| 13) $42 \cdot 81 \times 100$  | 14) $39 \cdot 91 \times 100$  | 15) $99 \cdot 81 \times 100$  |
| 16) $4 \cdot 3 \times 1000$   | 17) $6 \cdot 2 \times 1000$   | 18) $13 \cdot 3 \times 1000$  |
| 19) $19 \cdot 9 \times 1000$  | 20) $19 \cdot 91 \times 1000$ | 21) $14 \cdot 03 \times 100$  |
| 22) $39 \cdot 73 \times 1000$ | 23) $47 \cdot 83 \times 1000$ | 24) $57 \cdot 19 \times 1000$ |

## Exercise 4 (C) Multiply

- |                             |                             |                             |
|-----------------------------|-----------------------------|-----------------------------|
| 1) $3 \cdot 6 \times 10$    | 2) $5 \cdot 8 \times 10$    | 3) $6 \cdot 7 \times 10$    |
| 4) $36 \cdot 2 \times 10$   | 5) $81 \cdot 1 \times 10$   | 6) $1 \cdot 56 \times 10$   |
| 7) $4 \cdot 27 \times 10$   | 8) $9 \cdot 49 \times 10$   | 9) $36 \cdot 28 \times 10$  |
| 10) $92 \cdot 29 \times 10$ | 11) $3 \cdot 44 \times 100$ | 12) $5 \cdot 87 \times 100$ |

**13)**  $6.29 \times 100$

**14)**  $34.78 \times 100$

**15)**  $92.01 \times 100$

**16)**  $7.8 \times 100$

**17)**  $5.6 \times 100$

**18)**  $5.8 \times 100$

**19)**  $15.3 \times 100$

**20)**  $92.7 \times 100$

**21)**  $6.2 \times 2$

**22)**  $4.7 \times 3$

**23)**  $9.4 \times 4$

**24)**  $5.8 \times 5$

**25)**  $6.7 \times 6$

**26)**  $12.5 \times 7$

**27)**  $93.4 \times 8$

**28)**  $82.5 \times 9$

**29)**  $43.8 \times 2$

**30)**  $56.7 \times 3$

**31)**  $2.47 \times 4$

**32)**  $7.38 \times 5$

**33)**  $9.42 \times 6$

**34)**  $72.8 \times 7$

**35)**  $83.2 \times 8$

**36)**  $24.67 \times 9$

**37)**  $73.24 \times 2$

**38)**  $88.56 \times 8$

**39)**  $60.02 \times 6$

**40)**  $56.92 \times 4$

### Exercise 4 (A) Divide

**1)**  $57 \div 10$

**2)**  $6.2 \div 10$

**3)**  $13.4 \div 10$

**4)**  $28.6 \div 10$

**5)**  $38.24 \div 10$

**6)**  $17.83 \div 10$

**7)**  $210.5 \div 10$

**8)**  $57.5 \div 100$

**9)**  $203.2 \div 100$

**10)**  $2432.3 \div 100$

**11)**  $1325.8 \div 100$

**12)**  $672.3 \div 100$

**13)**  $5325.6 \div 100$

**14)**  $1769.73 \div 100$

**15)**  $2693.64 \div 1000$

**16)**  $1775.6 \div 1000$

**17)**  $2935.67 \div 1000$

**18)**  $1956.21 \div 1000$

**19)**  $1234.5 \div 1000$

**20)**  $7324.6 \div 1000$

### Exercise 4 (B) Divide

**1)**  $828.6 \div 2$

**2)**  $19.50 \div 6$

**3)**  $2.736 \div 6$

**4)**  $59.5 \div 5$

**5)**  $31.203 \div 9$

**6)**  $182.68 \div 4$

- 7)  $164 \cdot 92 \div 7$       8)  $0 \cdot 24 \div 2$       9)  $60 \cdot 444 \div 9$   
10)  $273 \cdot 6 \div 6$       11)  $54 \cdot 312 \div 8$       12)  $31 \cdot 56 \div 4$   
13)  $1461 \cdot 6 \div 4$       14)  $88 \cdot 74 \div 6$       15)  $235 \cdot 35 \div 3$   
16)  $16 \cdot 5 \div 5$       17)  $5 \cdot 31 \div 9$       18)  $12 \cdot 6 \div 2$   
19)  $8 \cdot 778 \div 7$       20)  $2 \cdot 368 \div 1000$

### Exercise 4 (C) Divide

- 1)  $5 \cdot 6 \div 10$       2)  $8 \cdot 4 \div 10$       3)  $4 \cdot 3 \div 10$   
4)  $36 \cdot 2 \div 10$       5)  $58 \cdot 5 \div 10$       6)  $43 \div 10$   
7)  $85 \div 10$       8)  $278 \div 10$       9)  $666 \div 10$   
10)  $910 \div 10$       11)  $534 \div 100$       12)  $637 \div 100$   
13)  $735 \div 100$       14)  $821 \div 100$       15)  $999 \div 10$   
16)  $42 \div 100$       17)  $63 \div 100$       18)  $77 \div 100$   
19)  $10 \div 100$       20)  $8 \div 100$       21)  $6 \cdot 8 \div 2$   
22)  $17 \cdot 1 \div 3$       23)  $22 \cdot 4 \div 4$       24)  $87 \cdot 5 \div 5$   
25)  $52 \cdot 2 \div 6$       26)  $33 \cdot 6 \div 7$       27)  $48 \cdot 8 \div 8$   
28)  $12 \cdot 6 \div 9$       29)  $47 \cdot 8 \div 2$       30)  $16 \cdot 47 \div 3$   
31)  $11 \cdot 48 \div 4$       32)  $42 \div 5$       33)  $14 \cdot 82 \div 6$   
34)  $44 \cdot 66 \div 7$       35)  $82 \div 8$       36)  $69 \cdot 93 \div 9$   
37)  $266 \cdot 8 \div 4$       38)  $355 \cdot 6 \div 7$       39)  $6 \cdot 84 \div 9$   
40)  $113 \cdot 6 \div 8$

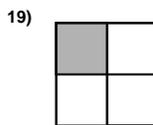
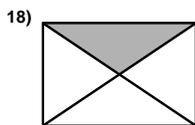
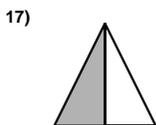
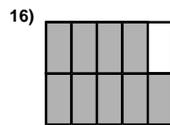
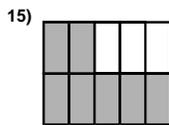
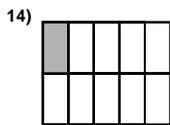
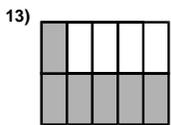
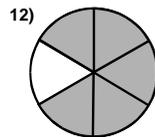
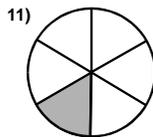
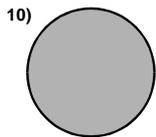
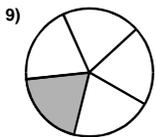
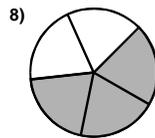
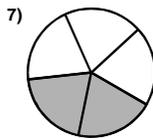
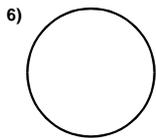
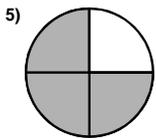
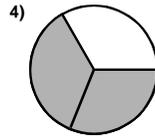
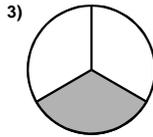
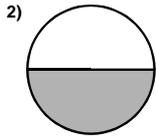
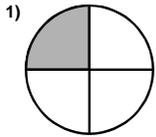
## Exercise 4 (A/B/C) Problems

- 1) Two tables are placed together to form a larger one. If the first table is 67.4 cm long and the second table is 56.8 cm long, what is the total length?
- 2) A piece of wood is 37.4 cm long. If 12.7 cm is cut off from one end what length remains?
- 3) A child places 5 toy bricks of length 14.6 cm in a straight line. What is the total length?
- 4) A piece of ribbon 114.8 cm long is shared equally among 7 girls. What length should each girl receive?
- 5) Three boxes weigh 4.6 kg, 7.9 kg and 18.2 kg. What is the total weight?
- 6) A bottle of Coca-Cola holds 2 litres. What volume remains after a glass of 0.35 litres has been removed?
- 7) What length of shelf is needed to hold books with thicknesses of 6.3 cm, 7.4 cm, 1.8 cm, 2.8 cm and 4.9 cm?
- 8) Billy does 10 press ups in 26.8 seconds. How long does he take for each press up?
- 9) Six spoonfuls of medicine each holding 5.1 ml are removed from a bottle containing 50 ml. How much medicine is left in the bottle?
- 10) A car uses 0.12 litres of petrol for every mile it travels. How many litres will be used in travelling 9 miles?

# Fractions

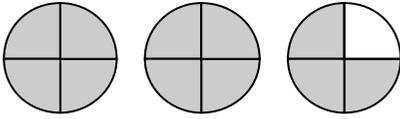
## Exercise 1 (A)

Write down the fraction shaded in each shape.

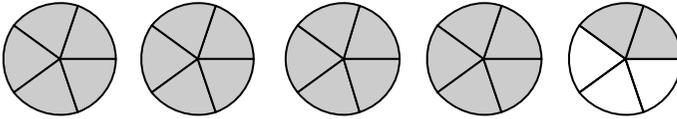


Write down the mixed number shaded in each shape.

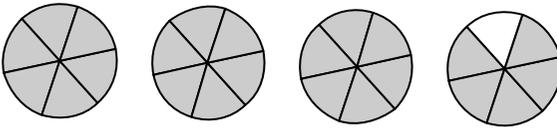
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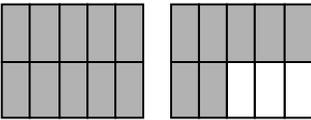
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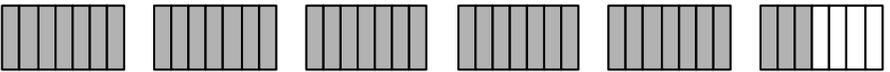
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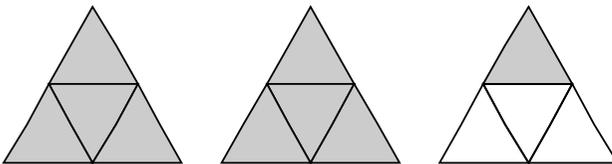
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25)

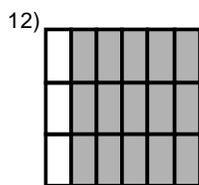
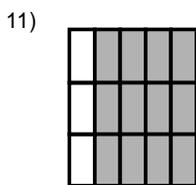
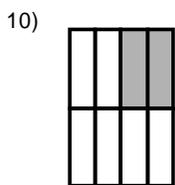
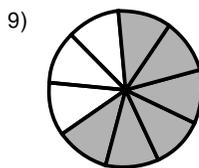
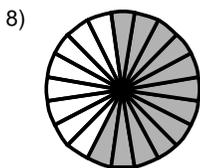
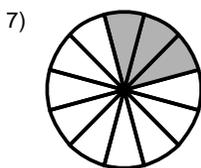
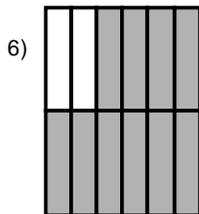
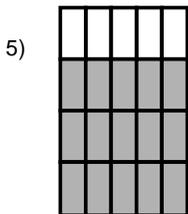
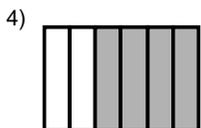
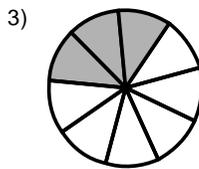
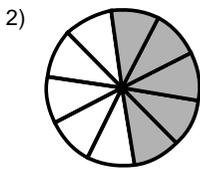
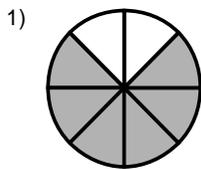


26)



## Exercise 2 (A)

### Pictorial Simplifying



## Exercise 2 (B)

Simplify the following fractions:-

1)  $\frac{4}{8}$

2)  $\frac{6}{9}$

3)  $\frac{8}{10}$

4)  $\frac{3}{6}$

5)  $\frac{6}{8}$

6)  $\frac{8}{12}$

7)  $\frac{10}{15}$

8)  $\frac{4}{6}$

- |                      |                      |                     |                       |
|----------------------|----------------------|---------------------|-----------------------|
| 9) $\frac{18}{27}$   | 10) $\frac{12}{14}$  | 11) $\frac{20}{25}$ | 12) $\frac{18}{30}$   |
| 13) $\frac{14}{49}$  | 14) $\frac{3}{15}$   | 15) $\frac{16}{36}$ | 16) $\frac{16}{40}$   |
| 17) $\frac{18}{42}$  | 18) $\frac{10}{50}$  | 19) $\frac{36}{45}$ | 20) $\frac{10}{14}$   |
| 21) $\frac{21}{24}$  | 22) $\frac{56}{64}$  | 23) $\frac{30}{48}$ | 24) $\frac{20}{45}$   |
| 25) $\frac{20}{50}$  | 26) $\frac{12}{32}$  | 27) $\frac{7}{56}$  | 28) $\frac{40}{64}$   |
| 29) $\frac{6}{27}$   | 30) $\frac{28}{36}$  | 31) $\frac{15}{50}$ | 32) $\frac{35}{63}$   |
| 33) $\frac{33}{44}$  | 34) $\frac{20}{80}$  | 35) $\frac{15}{60}$ | 36) $\frac{28}{42}$   |
| 37) $\frac{80}{112}$ | 38) $\frac{84}{105}$ | 39) $\frac{51}{85}$ | 40) $\frac{104}{156}$ |

### Exercise 3 (B)

Write the following improper fractions as mixed numbers in simplest form:-

- |                     |                     |                     |                     |
|---------------------|---------------------|---------------------|---------------------|
| 1) $\frac{3}{2}$    | 2) $\frac{4}{3}$    | 3) $\frac{5}{3}$    | 4) $\frac{5}{4}$    |
| 5) $\frac{4}{2}$    | 6) $\frac{5}{2}$    | 7) $\frac{7}{2}$    | 8) $\frac{7}{3}$    |
| 9) $\frac{21}{4}$   | 10) $\frac{14}{3}$  | 11) $\frac{37}{5}$  | 12) $\frac{40}{7}$  |
| 13) $\frac{9}{2}$   | 14) $\frac{19}{3}$  | 15) $\frac{9}{4}$   | 16) $\frac{42}{5}$  |
| 17) $\frac{29}{6}$  | 18) $\frac{20}{9}$  | 19) $\frac{35}{8}$  | 20) $\frac{30}{6}$  |
| 21) $\frac{67}{7}$  | 22) $\frac{39}{4}$  | 23) $\frac{55}{9}$  | 24) $\frac{40}{7}$  |
| 25) $\frac{28}{7}$  | 26) $\frac{61}{6}$  | 27) $\frac{59}{8}$  | 28) $\frac{28}{3}$  |
| 29) $\frac{17}{10}$ | 30) $\frac{25}{11}$ | 31) $\frac{29}{12}$ | 32) $\frac{52}{5}$  |
| 33) $\frac{83}{4}$  | 34) $\frac{124}{5}$ | 35) $\frac{185}{3}$ | 36) $\frac{349}{6}$ |

37)  $\frac{129}{7}$

38)  $\frac{359}{4}$

39)  $\frac{1177}{8}$

40)  $\frac{1627}{5}$

**Exercise 3 (C)**

Write the following improper fractions as mixed numbers in simplest form:-

1)  $\frac{8}{6}$

2)  $\frac{15}{10}$

3)  $\frac{6}{4}$

4)  $\frac{14}{8}$

5)  $\frac{16}{6}$

6)  $\frac{28}{8}$

7)  $\frac{30}{9}$

8)  $\frac{22}{4}$

9)  $\frac{58}{8}$

10)  $\frac{44}{6}$

11)  $\frac{51}{9}$

12)  $\frac{38}{4}$

13)  $\frac{34}{6}$

14)  $\frac{82}{8}$

15)  $\frac{30}{4}$

16)  $\frac{75}{9}$

17)  $\frac{351}{6}$

18)  $\frac{110}{4}$

19)  $\frac{1392}{9}$

20)  $\frac{782}{8}$

**Exercise 4(B)**

Write the following mixed numbers as improper fractions:-

- 1)  $1\frac{1}{2}$    2)  $1\frac{1}{4}$    3)  $1\frac{1}{3}$    4)  $1\frac{2}{3}$    5)  $1\frac{3}{4}$    6)  $1\frac{1}{5}$    7)  $1\frac{2}{5}$    8)  $1\frac{3}{5}$    9)  $1\frac{4}{5}$    10)  $1\frac{1}{6}$   
 11)  $1\frac{5}{6}$    12)  $1\frac{1}{8}$    13)  $1\frac{3}{8}$    14)  $1\frac{5}{8}$    15)  $1\frac{7}{8}$    16)  $2\frac{1}{2}$    17)  $2\frac{1}{4}$    18)  $2\frac{1}{3}$    19)  $2\frac{2}{3}$    20)  $2\frac{3}{4}$   
 21)  $2\frac{1}{5}$    22)  $2\frac{3}{5}$    23)  $2\frac{2}{7}$    24)  $2\frac{5}{7}$    25)  $2\frac{1}{8}$    26)  $2\frac{3}{8}$    27)  $2\frac{5}{8}$    28)  $2\frac{7}{8}$    29)  $3\frac{1}{4}$    30)  $3\frac{3}{4}$   
 31)  $3\frac{1}{8}$    32)  $3\frac{3}{8}$    33)  $3\frac{5}{8}$    34)  $3\frac{7}{8}$    35)  $3\frac{1}{3}$    36)  $3\frac{2}{3}$    37)  $3\frac{1}{6}$    38)  $3\frac{5}{6}$    39)  $4\frac{1}{4}$    40)  $4\frac{3}{4}$

**Exercise 5 (B)**

Copy and complete the following to make equivalent fractions:-

1)  $\frac{1}{3} = \frac{\quad}{6}$

2)  $\frac{3}{4} = \frac{\quad}{8}$

3)  $\frac{1}{2} = \frac{\quad}{8}$

4)  $\frac{2}{5} = \frac{\quad}{15}$

5)  $\frac{1}{5} = \frac{\quad}{20}$

6)  $\frac{3}{8} = \frac{\quad}{32}$

7)  $\frac{1}{6} = \frac{\quad}{30}$

8)  $\frac{5}{8} = \frac{\quad}{40}$

9)  $\frac{3}{5} = \frac{\quad}{30}$

10)  $\frac{2}{3} = \frac{\quad}{18}$

11)  $\frac{1}{4} = \frac{\quad}{36}$

12)  $\frac{1}{5} = \frac{\quad}{60}$

13)  $\frac{1}{8} = \frac{2}{\quad}$

14)  $\frac{7}{10} = \frac{14}{\quad}$

15)  $\frac{1}{12} = \frac{3}{\quad}$

16)  $\frac{4}{5} = \frac{12}{\quad}$

17)  $\frac{1}{9} = \frac{4}{\quad}$

18)  $\frac{5}{7} = \frac{20}{\quad}$

19)  $\frac{3}{8} = \frac{15}{\quad}$

20)  $\frac{5}{6} = \frac{25}{\quad}$

21)  $\frac{3}{4} = \frac{18}{\quad}$

22)  $\frac{2}{5} = \frac{14}{\quad}$

23)  $\frac{4}{5} = \frac{32}{\quad}$

24)  $\frac{2}{3} = \frac{24}{\quad}$

### Exercise 5 (C)

Copy and complete the following to make equivalent fractions:-

1)  $\frac{1}{4} = \frac{\quad}{36}$

2)  $\frac{1}{5} = \frac{\quad}{60}$

3)  $\frac{40}{45} = \frac{8}{\quad}$

4)  $\frac{30}{36} = \frac{5}{\quad}$

5)  $\frac{6}{54} = \frac{1}{\quad}$

6)  $\frac{45}{54} = \frac{5}{\quad}$

7)  $\frac{48}{108} = \frac{4}{\quad}$

8)  $\frac{75}{100} = \frac{3}{\quad}$

9)  $\frac{\quad}{2} = \frac{5}{10}$

10)  $\frac{\quad}{4} = \frac{9}{12}$

11)  $\frac{\quad}{8} = \frac{15}{40}$

12)  $\frac{\quad}{12} = \frac{25}{60}$

13)  $\frac{\quad}{15} = \frac{16}{60}$

14)  $\frac{1}{\quad} = \frac{5}{20}$

15)  $\frac{2}{\quad} = \frac{8}{12}$

16)  $\frac{4}{\quad} = \frac{24}{30}$

17)  $\frac{3}{\quad} = \frac{45}{60}$

18)  $\frac{7}{\quad} = \frac{35}{100}$

## Exercise 6 (A)

Evaluate:-

1)  $\frac{2}{7} + \frac{3}{7}$

2)  $\frac{1}{11} + \frac{3}{11}$

3)  $\frac{3}{8} + \frac{1}{8}$

4)  $\frac{6}{13} + \frac{5}{13}$

5)  $\frac{1}{8} + \frac{7}{8}$

6)  $\frac{1}{6} + \frac{1}{6}$

7)  $\frac{3}{16} + \frac{5}{16}$

8)  $\frac{3}{10} + \frac{1}{10}$

9)  $\frac{3}{15} + \frac{7}{15}$

10)  $\frac{3}{10} + \frac{9}{10}$

11)  $\frac{5}{12} - \frac{1}{12}$

12)  $\frac{1}{6} + \frac{5}{6}$

13)  $\frac{7}{12} + \frac{11}{12}$

14)  $\frac{3}{8} - \frac{1}{8}$

15)  $\frac{9}{17} - \frac{6}{17}$

## Exercise 6 (B)

Evaluate:-

1)  $\frac{1}{2} + \frac{1}{4}$

2)  $\frac{1}{2} + \frac{3}{4}$

3)  $\frac{1}{4} + \frac{1}{8}$

4)  $\frac{3}{4} + \frac{3}{8}$

5)  $\frac{1}{4} + \frac{7}{8}$

6)  $\frac{1}{3} + \frac{1}{6}$

7)  $\frac{2}{3} + \frac{5}{6}$

8)  $\frac{1}{5} + \frac{1}{10}$

9)  $\frac{3}{5} + \frac{7}{10}$

10)  $\frac{2}{5} + \frac{9}{10}$

11)  $\frac{1}{6} - \frac{1}{12}$

12)  $\frac{1}{6} + \frac{5}{12}$

13)  $\frac{5}{6} + \frac{11}{12}$

14)  $\frac{1}{2} - \frac{1}{8}$

15)  $\frac{1}{2} + \frac{3}{8}$

16)  $\frac{1}{2} + \frac{7}{8}$

17)  $\frac{1}{2} + \frac{1}{3}$

18)  $\frac{1}{2} + \frac{1}{5}$

19)  $\frac{1}{3} + \frac{1}{4}$

20)  $\frac{2}{3} + \frac{3}{4}$

21)  $\frac{1}{3} - \frac{1}{5}$

22)  $\frac{2}{3} + \frac{2}{5}$

23)  $\frac{1}{4} + \frac{1}{5}$

24)  $\frac{3}{4} + \frac{3}{5}$

25)  $\frac{2}{3} + \frac{1}{2}$

26)  $\frac{2}{3} + \frac{1}{4}$

27)  $\frac{1}{3} + \frac{4}{5}$

28)  $\frac{2}{3} + \frac{4}{5}$

29)  $\frac{1}{2} + \frac{3}{5}$

30)  $\frac{1}{3} + \frac{1}{8}$

31)  $\frac{2}{3} + \frac{5}{8}$

32)  $\frac{1}{5} + \frac{1}{8}$

33)  $\frac{2}{3} - \frac{3}{5}$

34)  $\frac{3}{4} + \frac{1}{6}$

35)  $\frac{3}{4} - \frac{5}{9}$

36)  $\frac{3}{8} + \frac{5}{6}$

37)  $\frac{1}{8} + \frac{5}{7}$

38)  $\frac{1}{4} + \frac{5}{6}$

39)  $\frac{3}{4} + \frac{1}{10}$

40)  $\frac{3}{8} + \frac{5}{12}$

### Exercise 6 (C)

1)  $1\frac{1}{2} + 1\frac{2}{3}$

2)  $1\frac{1}{3} + 1\frac{1}{4}$

3)  $2\frac{3}{8} + 1\frac{1}{2}$

4)  $2\frac{2}{3} + 1\frac{1}{4}$

5)  $2\frac{1}{3} + 1\frac{3}{4}$

6)  $3\frac{1}{3} + 2\frac{1}{4}$

7)  $1\frac{1}{3} - 1\frac{1}{4}$

8)  $1\frac{1}{6} + 1\frac{3}{4}$

9)  $2\frac{5}{6} - 1\frac{1}{4}$

10)  $3\frac{3}{4} + \frac{7}{16}$

11)  $1\frac{1}{4} + 2\frac{5}{16}$

12)  $2\frac{1}{4} + 1\frac{9}{16}$

13)  $1\frac{1}{5} + 2\frac{4}{15}$

14)  $2\frac{3}{5} + 1\frac{7}{15}$

15)  $3\frac{4}{5} - 1\frac{8}{15}$

16)  $2\frac{1}{5} - 1\frac{1}{10}$

17)  $1\frac{2}{5} + 2\frac{3}{10}$

18)  $\frac{4}{5} + 2\frac{7}{10}$

19)  $2\frac{2}{9} + 2\frac{1}{3}$

20)  $1\frac{2}{3} + 1\frac{3}{4}$

# Multiplying fractions

## Exercise 7(B)

1)  $\frac{1}{5} \times \frac{1}{2}$    2)  $\frac{1}{5} \times \frac{2}{3}$    3)  $\frac{1}{4} \times \frac{1}{2}$    4)  $\frac{1}{2} \times \frac{1}{3}$    5)  $\frac{1}{3} \times \frac{1}{4}$    6)  $4 \times \frac{3}{4}$

7)  $\frac{2}{3} \times 7$    8)  $\frac{1}{4} \times \frac{2}{5}$    9)  $\frac{1}{2} \times \frac{3}{4}$    10)  $\frac{1}{2} \times \frac{5}{7}$    11)  $\frac{1}{3} \times \frac{2}{3}$    12)  $\frac{1}{3} \times \frac{4}{5}$

13)  $\frac{1}{2} \times \frac{4}{5}$    14)  $\frac{1}{2} \times \frac{6}{7}$    15)  $\frac{1}{3} \times \frac{3}{4}$    16)  $\frac{1}{3} \times \frac{3}{5}$    17)  $\frac{2}{3} \times \frac{3}{5}$    18)  $\frac{2}{3} \times \frac{5}{8}$

19)  $\frac{3}{4} \times \frac{5}{6}$    20)  $\frac{3}{4} \times \frac{4}{5}$    21)  $\frac{2}{3} \times \frac{3}{4}$    22)  $\frac{3}{4} \times \frac{8}{9}$    23)  $\frac{2}{5} \times \frac{5}{8}$    24)  $\frac{5}{6} \times \frac{9}{10}$

25)  $\frac{5}{9} \times \frac{3}{10}$    26)  $\frac{3}{8} \times \frac{4}{15}$    27)  $\frac{3}{4} \times \frac{8}{9}$    28)  $\frac{5}{6} \times \frac{9}{20}$    29)  $\frac{5}{12} \times \frac{8}{15}$    30)  $\frac{5}{6} \times \frac{9}{10}$

31)  $\frac{9}{10} \times \frac{4}{15} \times \frac{1}{2}$    32)  $\frac{2}{3} \times \frac{5}{8} \times \frac{3}{10}$    33)  $\frac{3}{4} \times \frac{5}{6} \times \frac{4}{5}$    34)  $\frac{3}{8} \times \frac{4}{5} \times \frac{5}{9}$    35)  $\frac{5}{8} \times \frac{3}{5} \times \frac{4}{9}$

36)  $\frac{5}{8} \times \frac{3}{8} \times \frac{4}{5}$    37)  $\frac{2}{3} \times \frac{3}{5} \times \frac{5}{6}$    38)  $\frac{3}{7} \times \frac{14}{15} \times \frac{5}{8}$    39)  $\frac{5}{9} \times \frac{6}{7} \times \frac{14}{15}$    40)  $\frac{5}{7} \times \frac{14}{15} \times \frac{3}{4}$

## Exercise 7(C)

1)  $\frac{2}{3} \times 1\frac{1}{2}$    2)  $\frac{3}{4} \times 1\frac{1}{3}$    3)  $\frac{2}{5} \times 2\frac{1}{2}$    4)  $1\frac{3}{4} \times 2$    5)  $2\frac{2}{3} \times 3$    6)  $3 \times 1\frac{5}{6}$

7)  $\frac{3}{5} \times 3\frac{1}{3}$    8)  $1\frac{1}{2} \times 3$    9)  $\frac{4}{7} \times 1\frac{3}{4}$    10)  $\frac{5}{8} \times 3\frac{1}{5}$    11)  $1\frac{1}{4} \times \frac{4}{5}$    12)  $1\frac{2}{5} \times \frac{5}{7}$

13)  $1\frac{1}{2} \times 1\frac{1}{3}$    14)  $1\frac{2}{3} \times 1\frac{1}{5}$    15)  $1\frac{3}{4} \times 1\frac{1}{7}$    16)  $1\frac{3}{5} \times 1\frac{1}{4}$    17)  $3\frac{1}{5} \times 1\frac{1}{4}$    18)  $3\frac{3}{4} \times 1\frac{3}{5}$

19)  $1\frac{1}{5} \times 3\frac{3}{4}$    20)  $1\frac{5}{7} \times 3\frac{1}{2}$    21)  $2\frac{1}{4} \times 2\frac{2}{3}$    22)  $1\frac{1}{8} \times \frac{2}{3}$    23)  $1\frac{7}{9} \times \frac{3}{8}$    24)  $2\frac{1}{12} \times \frac{4}{5}$

25)  $3\frac{3}{4} \times \frac{2}{5}$    26)  $2\frac{1}{10} \times 1\frac{2}{3}$    27)  $2\frac{2}{5} \times 1\frac{1}{9}$    28)  $1\frac{1}{5} \times 1\frac{7}{8}$    29)  $1\frac{1}{9} \times \frac{3}{5}$    30)  $2\frac{2}{9} \times \frac{6}{25}$

## Dividing Fractions

### Exercise 8(B)

- 1)  $5 \div \frac{1}{4}$     2)  $4 \div \frac{5}{6}$     3)  $8 \div \frac{2}{3}$     4)  $\frac{5}{6} \div 5$     5)  $\frac{1}{5} \div 5$     6)  $\frac{6}{11} \div 6$
- 7)  $\frac{3}{4} \div 6$     8)  $\frac{2}{3} \div 12$     9)  $\frac{1}{2} \div \frac{1}{2}$     10)  $\frac{1}{3} \div \frac{1}{3}$     11)  $\frac{1}{4} \div \frac{1}{4}$     12)  $\frac{1}{5} \div \frac{1}{5}$
- 13)  $\frac{1}{2} \div \frac{1}{3}$     14)  $\frac{1}{3} \div \frac{1}{4}$     15)  $\frac{1}{4} \div \frac{1}{5}$     16)  $\frac{1}{5} \div \frac{1}{6}$     17)  $\frac{1}{2} \div \frac{2}{3}$     18)  $\frac{2}{3} \div \frac{3}{4}$
- 19)  $\frac{3}{4} \div \frac{4}{5}$     20)  $\frac{4}{5} \div \frac{5}{6}$     21)  $\frac{2}{3} \div \frac{5}{6}$     22)  $\frac{3}{4} \div \frac{5}{8}$     23)  $\frac{4}{5} \div \frac{3}{4}$     24)  $\frac{5}{6} \div \frac{4}{5}$
- 25)  $\frac{7}{10} \div \frac{7}{8}$     26)  $\frac{3}{8} \div \frac{9}{10}$     27)  $\frac{2}{9} \div \frac{8}{15}$     28)  $\frac{5}{9} \div \frac{5}{12}$     29)  $\frac{9}{10} \div \frac{3}{5}$     30)  $\frac{8}{15} \div \frac{4}{9}$
- 31)  $\frac{2}{3} \div \frac{5}{6}$     32)  $\frac{2}{3} \div \frac{1}{2}$     33)  $\frac{3}{4} \div \frac{1}{3}$     34)  $\frac{8}{9} \div \frac{4}{5}$     35)  $\frac{9}{10} \div \frac{3}{8}$     36)  $\frac{5}{6} \div \frac{2}{3}$
- 37)  $\frac{4}{9} \div \frac{2}{3}$     38)  $\frac{2}{5} \div \frac{4}{15}$     39)  $\frac{5}{12} \div \frac{3}{4}$     40)  $\frac{6}{7} \div \frac{3}{14}$

### Exercise 8(C)

- 1)  $1\frac{7}{8} \div 5$     2)  $2\frac{4}{5} \div 7$     3)  $1\frac{3}{5} \div \frac{2}{3}$     4)  $\frac{4}{5} \div 3\frac{1}{5}$     5)  $6 \div 1\frac{3}{5}$
- 6)  $2\frac{2}{3} \div \frac{4}{5}$     7)  $3\frac{1}{2} \div 4\frac{1}{5}$     8)  $1\frac{2}{3} \div \frac{1}{3}$     9)  $1\frac{1}{2} \div 2\frac{1}{4}$     10)  $2\frac{1}{4} \div 1\frac{1}{2}$
- 11)  $1\frac{2}{3} \div 2\frac{2}{9}$     12)  $2\frac{2}{9} \div 1\frac{2}{3}$     13)  $3\frac{1}{3} \div 1\frac{2}{3}$     14)  $4\frac{2}{5} \div 1\frac{1}{10}$     15)  $4\frac{1}{6} \div 3\frac{3}{4}$
- 16)  $3\frac{1}{7} \div 2\frac{5}{14}$     17)  $3\frac{1}{5} \div 1\frac{7}{25}$     18)  $2\frac{4}{7} \div 1\frac{5}{7}$     19)  $1\frac{19}{26} \div 1\frac{2}{13}$     20)  $1\frac{2}{17} \div 1\frac{25}{51}$
- 21)  $1\frac{1}{15} \div 1\frac{3}{5}$     22)  $1\frac{7}{8} \div 2\frac{1}{2}$     23)  $1\frac{1}{8} \div \frac{3}{4}$     24)  $1\frac{1}{20} \div \frac{3}{5}$     25)  $3\frac{3}{5} \div \frac{9}{10}$
- 26)  $\frac{4}{9} \div 2\frac{2}{3}$     27)  $2\frac{1}{10} \div 2\frac{4}{5}$     28)  $2\frac{2}{5} \div \frac{8}{15}$     29)  $2\frac{1}{4} \div \frac{3}{10}$     30)  $1\frac{7}{8} \div 4\frac{1}{6}$

## Exercise 9(A) Fraction of a quantity

- 1)  $\frac{1}{2}$  of 48      2)  $\frac{1}{4}$  of 20      3)  $\frac{1}{3}$  of 36      4)  $\frac{1}{2}$  of 62
- 5)  $\frac{1}{3}$  of 42      6)  $\frac{1}{4}$  of 52      7)  $\frac{1}{5}$  of 35      8)  $\frac{1}{5}$  of 60
- 9)  $\frac{1}{2}$  of 76      10)  $\frac{1}{3}$  of 54      11)  $\frac{1}{4}$  of 72      12)  $\frac{1}{3}$  of 75
- 13)  $\frac{1}{5}$  of 80      14)  $\frac{1}{5}$  of 75      15)  $\frac{1}{2}$  of 92      16)  $\frac{1}{3}$  of 81
- 17)  $\frac{1}{4}$  of 60      18)  $\frac{1}{5}$  of 90      19)  $\frac{1}{8}$  of 24      20)  $\frac{1}{8}$  of 40
- 21)  $\frac{1}{8}$  of 56      22)  $\frac{1}{8}$  of 80      23)  $\frac{1}{10}$  of 40      24)  $\frac{1}{10}$  of 50
- 25)  $\frac{1}{10}$  of 70      26)  $\frac{1}{10}$  of 90      27)  $\frac{1}{5}$  of 85      28)  $\frac{1}{2}$  of 48
- 29)  $\frac{1}{8}$  of 96      30)  $\frac{1}{3}$  of 96      31)  $\frac{1}{2}$  of 13      32)  $\frac{1}{2}$  of 19

## Exercise 9(B)

- 1)  $\frac{1}{3}$  of 138      2)  $\frac{1}{5}$  of 450      3)  $\frac{1}{8}$  of 480
- 4)  $\frac{1}{10}$  of 560      5)  $\frac{1}{20}$  of 860      6)  $\frac{1}{100}$  of 3800
- 7)  $\frac{2}{3}$  of 156      8)  $\frac{3}{5}$  of 935      9)  $\frac{2}{5}$  of 470

10)  $\frac{3}{8}$  of 576

11)  $\frac{5}{8}$  of 192

12)  $\frac{7}{8}$  of 304

13)  $\frac{3}{10}$  of 370

14)  $\frac{5}{8}$  of 128

15)  $\frac{7}{10}$  of 790

16)  $\frac{9}{10}$  of 450

17)  $\frac{3}{20}$  of 660

18)  $\frac{3}{8}$  of 776

19)  $\frac{7}{20}$  of 780

20)  $\frac{9}{20}$  of 540

21)  $\frac{7}{20}$  of 540

22)  $\frac{4}{5}$  of 145

23)  $\frac{3}{10}$  of 650

24)  $\frac{3}{8}$  of 424

25)  $\frac{7}{8}$  of 360

26)  $\frac{3}{5}$  of 480

27)  $\frac{3}{10}$  of 120

28)  $\frac{4}{5}$  of 290

29)  $\frac{7}{10}$  of 240

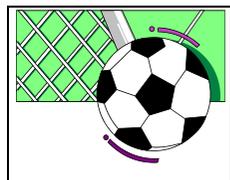
30)  $\frac{7}{8}$  of 496

### Exercise 9(C)

1) a) A football match last 90 minutes. How long is the first half?

b) A rugby match lasts 80 minutes. How many minutes does the first quarter last?

2) Brian has 45p, but he owes  $\frac{1}{5}$  of it to Peter.



a) How much does he owe to Peter? b) How much does he have left?

3)  $\frac{3}{10}$  of class of 30 pupils are absent.

- a) How many are absent?    b) How many are present?
- 4) 42 cars are in the car park.  $\frac{1}{3}$  of them are blue.  
How many blue cars are there?
- 5) Calculate these amounts in pence.
- a)  $\frac{1}{10}$  of £1      b)  $\frac{3}{10}$  of £2      c)  $\frac{3}{4}$  of £1      d)  $\frac{1}{2}$  of £5
- e)  $\frac{1}{5}$  of £2      f)  $\frac{2}{3}$  of £1.50
- 6) John gets  $\frac{2}{3}$  of £72 as a prize. How much money does he get?
- 7) A tank holds 1600 litres of oil when it is full. If it is  $\frac{1}{4}$  full, how many litres have been used?
- 8) Calculate
- a)  $\frac{2}{3}$  of 12cm  $\frac{2}{3}$       b)  $\frac{3}{4}$  of 20 pupils
- c)  $\frac{2}{5}$  of 30 grams  $\frac{2}{5}$       d)  $\frac{7}{8}$  of 24 days
- 9) There are 60 minutes in an hour. How many minutes are there in:
- a)  $\frac{1}{2}$  hour      b)  $\frac{1}{4}$  hour      c)  $\frac{3}{4}$  hour      d)  $\frac{1}{3}$  hour
- 10) In a test,  $\frac{1}{5}$  of the pupils will be given an **A** grade,  $\frac{1}{2}$  a **B** grade,  $\frac{1}{4}$  a **C** grade and the rest a **D** grade.  
Out of a group of 40 pupils, how many will get each grade?
- 11) Calculate

a)  $\frac{3}{4}$  of £100      b)  $\frac{1}{10}$  of £120      c)  $\frac{3}{8}$  of £40      d)  $\frac{2}{5}$  of £35

12) There are  $90^\circ$  in a right angle. How many degrees are in:

a)  $\frac{2}{3}$  of a right angle      b)  $\frac{3}{4}$  of a right angle      c)  $\frac{3}{5}$  of a right angle

13)  $\frac{2}{3}$  of a person's weight is water. Jean weighs 63 kg.

How much of this is water?

14) Calculate

a)  $\frac{3}{10}$  of 240 m      b)  $\frac{2}{3}$  of 210 kg      c)  $\frac{3}{5}$  of 600 pupils      d)  $\frac{5}{8}$  of 120 cm

15) Calculate the length of video tape needed to record **two** TV programmes each lasting  $\frac{3}{4}$  of an hour.

16) Calculate to the nearest penny

a)  $\frac{1}{7} \times \text{£}5$       b)  $\frac{5}{12} \times \text{£}11$       c)  $\frac{5}{16} \times 89 \text{ p}$   
d)  $\frac{4}{9} \times 75 \text{ p}$       e)  $\frac{4}{15} \times \text{£}26$       f)  $\frac{3}{5} \times \text{£}8.66$

17) Calculate to the nearest penny

a)  $\frac{3}{4} \times \text{£}7.33$       b)  $\frac{2}{7} \times \text{£}5.44$       c)  $\frac{3}{8} \times \text{£}9$

18) An aircraft flying at 1800 km per hour reduces its speed by half, and then by a further three quarters for landing. Calculate its landing speed.

# Percentages, Fractions & Decimals

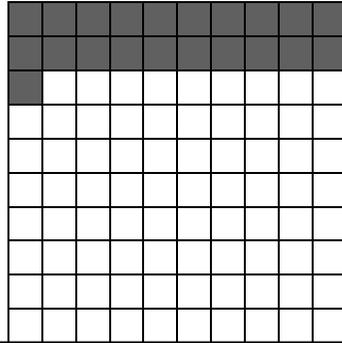
When a quantity is divided into 100 “bits” each bit is called “1 percent”.

$$21\% = \frac{21}{100} = 0.21$$

Percentage

Fraction

Decimal



## Exercise 1(B)

- Write each percentage as a fraction *and* as a decimal:  
a) 50%      b) 25%      c) 75%      d) 20%      e) 10%
- Write the following percentages as fractions:  
a)  $33\frac{1}{3}\%$       b)  $66\frac{2}{3}\%$       c) 40%      d) 60%      e) 80%
- 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%
- Write each fraction as a percentage *and* as a decimal:  
a)  $\frac{33}{100}$       b)  $\frac{83}{100}$       c)  $\frac{3}{100}$       d)  $\frac{17}{100}$   
e)  $\frac{31}{100}$       f)  $\frac{71}{100}$       g)  $\frac{9}{100}$       h)  $\frac{53}{100}$
- 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

- 6 A survey found that 45 out of 100 cars have alarms fitted. What percentage **a)** have alarms fitted **b)** don't have alarms fitted?
- 7 67 people out of 100 said that they were holidaying in Scotland this year. What percentage are **a)** holidaying in Scotland **b)** holidaying abroad?
- 8 A survey found that only 34 out of 100 people eat breakfast in the morning. What percentage **a)** eat breakfast **b)** don't eat breakfast?

### Exercise 1(C)

- 1 Write the following fractions as percentages *and* decimals:

- a)  $\frac{7}{50}$       b)  $\frac{3}{50}$       c)  $\frac{12}{25}$       d)  $\frac{7}{20}$       e)  $\frac{13}{20}$
- f)  $\frac{7}{10}$       g)  $\frac{3}{10}$       h)  $\frac{9}{10}$       i)  $\frac{16}{40}$       j)  $\frac{34}{40}$
- k)  $\frac{12}{80}$       l)  $\frac{36}{90}$       m)  $\frac{7}{70}$       n)  $\frac{12}{75}$       o)  $\frac{9}{75}$

### Percentages as Fractions in Simplest Form

#### Exercise 2(B)

- 1 Write each percentage as a fraction in its simplest form:
- a) 40%      b) 20%      c) 90%      d) 4%      e) 12%
- f) 16%      g) 80%      h) 30%      i) 35%      j) 55%
- k) 22%      l) 95%      m) 28%      n) 36%      o) 48%
- 2 The label below shows the nutritional content from a tub of coleslaw. Change the percentage of each nutritional element to a fraction in its simplest form.



<b><u>COLESLAW</u></b>	
Total Fat	24%
Saturated Fat	15%
Cholesterol	2%
Sodium	8%

## Exercise 2(C)

- 1 Write each percentage as a fraction in its simplest form:
- a) 18%      b) 42%      c) 34%      d) 46%      e) 58%  
f) 68%      g) 72%      h) 76%      i) 6%      j) 56%  
k) 96%      l) 14%      m) 32%      n) 92%      o) 52%
- 2 Jane scored 68% in her maths test whilst Alice scored 15 out of 25. Who had the better result?
- 3 Ed scored 19 out of 25 in his English test and 14 out of 20 in his Maths test. Which subject did he do better in and by what percentage?
- 4 Shameela and Ben had both been told by their doctor that they should lose weight. Shameela weighed 112 kg and Ben weighed 82 kg.
- After two months of healthy eating, Shameela had lost 6 kg and Ben had lost 6% of his body weight.
- Shameela claimed to have lost more weight but Ben said that he had lost the higher percentage of her body weight. Was he right?

## NON CALCULATOR PERCENTAGES

### Exercise 3(A)

- 1 **Work out:**
- a) 50% of £84      b) 25% of £1000      c) 20% of £80  
d) 10% of £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?

### Exercise 3(B)

**1 Work out:**

- |                                   |                                 |                             |
|-----------------------------------|---------------------------------|-----------------------------|
| a) 50% of £3·20                   | b) 25% of £852                  | c) 20% of £8                |
| d) 10% of £60                     | e) 10% of 43g                   | f) $33\frac{1}{3}\%$ of £39 |
| g) 25% of £1260                   | h) 10% of 52cm                  | i) 20% of £7·50             |
| j) 75% of £4·80                   | k) 60% of £12 000               | l) 80% of £550              |
| 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               |
| s) 50% of £ $\frac{1}{2}$ million | t) 40% of £390                  | u) 70% of 60p               |
| v) 30% of 1750kg                  | w) 90% of 50p                   | x) 60% of £75               |
| y) 80% of £21                     | z) 70% of £8                    |                             |

2 From 1(d) you will see that 10% of £60 = £6. Use this result to write down:

- (i) 30%      (ii) 5%      (iv) 15%

3 For £80 calculate:

- (i) 10%      (ii) 30%      (iii) 5%      (iv) 15%

4 For £40 calculate:

- (i) 10%      (ii) 30%      (iii) 5%      (iv) 15%

- 5 State 2 different ways of calculating 15% without a calculator.
- 6  $33\frac{1}{3}\%$  of the passengers in a train containing 267 passengers continue on the train until its destination.  
How many passengers:  
a) continue to the final stop                      b) get out before the final stop?
- 7 75% of the people in a room are over the age of 30. If there are 754 people in a room, how many of them are:  
a) over the age of 30    b) under the age of 30?
- 8 On a cruise ship, 40% of the passengers are ladies, 35% are men, 15% are girls and the rest are boys. There are 2400 passengers. How many are  
a) ladies                      b) men                      c) girls                      d) boys?
- 9 A car costs £12 500 when new. At the of the first year its value is  $66\frac{2}{3}\%$  of the new price. At the end of the second year its value is 75% of the value after 1 year. At the end of the third year, its value is 80% of the value after 2 years. What is the value of the car at the end of  
a) 1 year                      b) 2 years                      c) 3 years?

### Exercise 3(C)

**1 Work out:**

- |                 |                 |                 |
|-----------------|-----------------|-----------------|
| a) 30% of £450  | b) 70% of 240kg | c) 90% of £8    |
| d) 40% of 640m  | e) 80% of £75   | f) 90% of £62   |
| g) 35% of 600kg | h) 55% of £800  | i) 85% of £90   |
| j) 65% of £540  | k) 60% of £862  | l) 80% of £48   |
| m) 15% of £16   | n) 15% of £64   | o) 15% of £8.20 |
| p) 8% of £340   | q) 6% of £850kg | r) 9% of £250   |
| s) 4% of 750ml  | t) 3% of 500m   | u) 7% of £8     |
| v) 2% of 480kg  | w) 1% of £5     | x) 32% of £70   |
| y) 36% of £20   | z) 53% of £86   |                 |

- 2 Heidi is offered 11% of £350 or 45% of £80.  
Which offer should Heidi take?
- 3 Goats' cheese contains 15% fat.  
How much fat is there in a pack which contains:
- a) 240g                      b) 460g                      c) 0.86kg                      d) 0.38kg
- 4 Of the 3 cakes below, which one, *per helping*, is better for you in terms of fat content? (assume the cupcake is 1 helping)



500g Chocolate Cake  
18% Fat



250g Carrot Cake  
8% Fat



50g Cupcake  
12% Fat



A computer catalogue quotes prices to which a tax of  $17\frac{1}{2}\%$  (VAT) must be added. What would be the price of the computer above?

## CALCULATOR PERCENTAGES

### Reminder!

$$\begin{aligned} & \text{35\% of } \pounds 640 \\ = & \frac{35}{100} \times 640 \\ = & 35 \div 100 \times 640 \\ = & \pounds 224 \end{aligned}$$

### Exercise 4(A)

Calculate:

- |                  |                 |                  |                  |
|------------------|-----------------|------------------|------------------|
| a) 12% of £600   | b) 23% of £280  | c) 36% of £25    | d) 28% of £522   |
| e) 24% of £16.50 | f) 19% of £343  | g) 57% of £62    | h) 42% of £812   |
| i) 83% of £4100  | j) 18% of £94   | k) 74% of £26    | l) 14% of £598   |
| m) 82% of £84    | n) 18% of 22.50 | o) 12% of £85.50 | p) 76% of £55.50 |
| q) 92% of £630   | r) 42% of £720  | s) 55% of £682   | t) 16% of £15    |
| u) 6% of £35     | v) 8% of £45    | w) 3% of £150    | x) 2% of £60     |
| y) 9% of £880    | z) 7% of £20    |                  |                  |

### Exercise 4(B)

Calculate:

- |                            |                             |                             |                            |
|----------------------------|-----------------------------|-----------------------------|----------------------------|
| a) 7% of £16               | b) 9% of £65                | c) 41% of £25               | d) 89% of £530             |
| d) 17% of £380             | e) 22% of £60               | f) 46% of £5                | g) 22% of £680             |
| h) 7% of £50               | i) 19% of £60               | j) 35% of £14               | k) 11% of £90              |
| l) 44% of £12.50           | m) 5% of £17                | n) 6% of £90                | o) 84% of £68.50           |
| p) 8.5% of £64             | q) 7.2% of £620             | r) 3.1% of £540             | s) 10.7% of £8890          |
| t) $4\frac{1}{2}\%$ of £18 | u) $12\frac{1}{2}\%$ of £84 | v) $3\frac{1}{2}\%$ of £650 | w) $2\frac{1}{2}\%$ of £12 |

x) 6% of £52·30    y) 19% of £12·40    z) 84% of £658·70

## Exercise 4(C)

Calculate:

- a) 4·7% of £16    b) 2·9% of £63·50    c) 41·6% of £25·40    d) 6·4% of £32  
e) 1·7% of £95    e) 54·8% of £432·20    f) 4·35% of £5    g) 1·65% of £24  
i)  $7\frac{1}{4}\%$  of £86    i)  $5\frac{1}{4}\%$  of £20    j)  $9\frac{1}{4}\%$  of £34    k)  $11\frac{1}{4}\%$  of £600  
m)  $10\frac{1}{4}\%$  of £20    m)  $10\frac{1}{4}\%$  of £77    n)  $40\frac{1}{4}\%$  of £61  
o)  $80\frac{1}{4}\%$  of £68·50  
q)  $2\frac{3}{4}\%$  of £18    q)  $7\frac{3}{4}\%$  of £62·10    r)  $3\frac{3}{4}\%$  of £637    s)  $10\frac{3}{4}\%$  of £8890  
u)  $4\frac{1}{5}\%$  of £48    u)  $6\frac{1}{5}\%$  of £52    v)  $3\frac{2}{5}\%$  of £420    w)  $2\frac{2}{5}\%$  of £14  
y)  $6\frac{3}{5}\%$  of £88    y)  $19\frac{3}{5}\%$  of £12·40    z)  $10\frac{3}{5}\%$  of £658·70

## PERCENTAGE INCREASE & DECREASE

### Exercise 5(B) Non Calculator Questions

- 1 A lawnmower costing £130 is **reduced** by 50% in a sale.  
Calculate the sale price of the lawnmower.
- 2 A gamestation costing £120 is in the sale marked "**25% discount.**"  
Calculate the sale price of the game station.
- 3 A pair of shoes are **reduced** by 10%.  
If the shoes cost £50 full price, how much are they after the discount?
- 4 Simon has a new bike which should have cost him £350 from the factory.  
He received a 20% **discount** for taking the shop display bike.  
How much did Simon pay for the bike?
- 5 A tourist helicopter ride to the Grand Canyon costs £162. Children under 5 years of age receive a 75% **discount**. How much does it cost for a child under 5 years of age to visit the Grand Canyon?

- 6 A shampoo bottle usually holds 240ml. In a special offer 25% is **added** to the contents. Calculate the amount of shampoo in the special offer bottle.
- 7 A cake shop decides to **increase** the weight of each cake by 20%. Each cake used to weigh 1600g. How much does each cake weigh now?
- 8 A painting costing £320 has its price **raised** by 50%. How much does the painting cost now?
- 9 A man buys a car at an auction for £2460. He fixes it up and sells it with a price **increase** of 20%. How much does he sell it for?
- 10 A recipe uses 72g of sugar. Mrs Helder decides to **increase** this amount by 25%. How much sugar does Mrs Helder need?

### Exercise 5(C)

- 1 Milk costs 80p per litre, but the price is expected to rise shortly by 5%. What will the new cost of a litre of milk be?
- 2 Johnny takes the local bus to school. His return fare is £1.50 per day. The bus company decides to increase all their fares by 20%. What will Johnny's new return fare be?
- 3 In a sale a pair of shoes, normally priced at £47.52, are reduced by 25%. What is the sale price of the shoes?
- 4 The average attendance at a football stadium last season was 48000. This season it has dropped by 15%. What is the average attendance at the stadium this season?
- 5 Farmer Yates had 60 cattle, but due to an outbreak of sickness he lost 85% of his herd. How many cattle does he still have left?

## Exercise 6(A)

### Calculator Questions

- 1 Calculate the sale price of the following items with the **reductions** stated:

	ITEM	NORMAL PRICE	DISCOUNT
(a)	T.V	£350	15%
(b)	D.V.D 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 after the following **increases**:

	ITEM	COST	INCREASE
(a)	Laptop	£400	12%
(b)	Camera	£560	35%
(c)	Calculator	£12	14%
(d)	Playstation	£200	32%
	ITEM	COST	INCREASE
(e)	Ornament	£34	26%
(f)	Book	£15.50	16%
(g)	CD	£12	11%
(h)	Jacket	£55	23%

## Exercise 6(B)

- 1 Calculate the sale price of the following items with the reductions stated:

	ITEM	NORMAL PRICE	DISCOUNT
(a)	T.V.	£350	15%
(b)	V.C.R.	£440	22%
(c)	HI-FI System	£849	18%
(d)	Skirt	£84.20	37%
(e)	Shirt	£35.60	28%
(f)	Ornament	£64.85	45%
(g)	Table	£220	7½ %
(h)	Carpet	£640	18½ %
(i)	Fitted Kitchen	£5,800	26%
(j)	Magazine	85p	11%
(k)	Bag of sweets	£1.19	24%
(l)	Shoes	£44.44	4¼ %

- 2 Calculate the new price of the following items after the following increases:

	ITEM	COST	INCREASE
(a)	Laptop	£487	13%
(b)	Camera	£250.50	35%
(c)	Calculator	£8.49	12%
(d)	Playstation	£199.50	21%
(e)	Ornament	£34.20	24%
(f)	Book	£15.50	17%
(g)	CD	£9.99	11%

## FURTHER PROBLEMS

### Exercise 7(B)

1. A salesman has a salary of £16500. He receives a bonus of 4% of his salary. How much does he get altogether?
2. £820 is divided between 2 ladies. One gets 65%.  
How much does **each** receive?
3. In a class of 40 pupils, 55% are girls. How many boys are there?
4. In 1981, the population of a town was 8030. By 1991, the population was just 90% of this figure. What was the population in 1991?
5. A car cost £12460 when new. A year later, its value was only 75% of this. What was its value a year later?
6. The composition of brass by weight is **64% copper, 32% zinc and the remainder is lead**. Find the weight of  
**(a)** copper            **(b)** zinc            **(c)** lead in 650 kg of brass.
7. During a sale, all items are sold with 15% off their usual cost. What is the sale price of a CD which usually costs £12.20?
8. There are 40 people in a doctor's waiting room. 65% are **male**.  
How many are **female**?
9. The rental on a flat is £360 per month. Ted and Lucy get a special deal and only have to pay 85% of this. How much did they pay per month?
10. A university noticed that 16% of the new students dropped out by the end of the first year.  
If there were 1350 new students, how many dropped out?
11. The Dragons basketball team play 40 matches in the season.  
They win 55%, draw 22.5% and lose the rest.  
Calculate the number of    **a)** wins            **b)** draws    **c)** losses.
12. Mrs Wilson pays 12.5% tax on her fuel bills. Calculate the tax on her  
**a)** gas bill of £144            **b)** electric bill of £99

## Exercise 7(C)

- Everyone should eat 5 portions of fruit or vegetables every day. The first food Harry eats one morning is an apple for breakfast:
  - What percentage of his recommended daily amount has he had?
  - If he eats a portion of sweet corn with his lunch and a banana after lunch what percentage of Harry's recommended daily allowance has he still to eat?
- What is the largest number; 6% of 100, 2% of 300 or 1% of 700?
- What is the biggest amount of money; 25% of £200, 30% of £150 or 60% of £90?
- A 500g Mars Bar contains 20% sugar, a 400g Snickers contains 22% sugar and a 350g Topic contains 26% sugar.
  - Calculate the amount of grams of sugar there are in each bar.
  - What bar has the most sugar in it?
- 3 breakfast cereals each claim to have a low percentage salt content. In a 500g packet of Cornyflakes there are 7.5 grams of salt, a 1kg packet of Crispie Rice has 16 grams of salt and a 200g packet of Sugar Pops has 2.8 grams of salt.
  - Calculate the percentage of salt in all 3 cereals
  - Which cereal has the lowest salt content?
- The recommended daily amount of salt is 6 grams. Sarah's breakfast had 1.5 grams of salt in it. What percentage of her recommended daily amount has she had?
- 3 different packets of Cheese and Onion crisps are tested for saturated fat.

Walkers 30g packet has 3g of saturated fat  
Golden Wonder 25g packet has 2.6g of saturated fat  
McCoys 35g packet has 3.4g of saturated fat

What crisps would be the healthiest option?  
You must give a reason for your answer.

- 8.** Mescó's the supermarket sells healthy choice ready made meals. They have 1.5 grams of fat per 100 grams. What is the percentage of fat in these meals?  
Angela in the school canteen makes her own versions of these meals. These weigh 300 grams and have a fat content of 4 grams. What meal contains the least percentage of fat?
- 9.** Before adding milk a 60g portion of All Bran cereal contains 15g of sugar, a 70g portion of Corn Flakes contains 17g of sugar and a 50g portion of Frosties contains 14g of sugar. What would the healthiest breakfast cereal be? You must give a reason for your answer.
- 10.** A 250ml can of Red Bull contains 1ml of caffeine, a 330ml of Coca Cola contains 1.1ml of caffeine and a 500 can of Diet Irn Bru contains 1.2ml of caffeine. Which of these cans would be the worst to drink if you want to go to sleep soon? You must give a reason for your answer.
- 11.** John, Peter and James all want to increase their weightlifting. They all train hard and after 2 months John has improved from being able to lift 45kg and can now lift 50kg. Peter could lift 48kg and can now lift 54kg while James could lift 55g and can now lift 61kg. Which of the 3 boys has improved the most compared to their original weightlifting abilities?
- 12.** Sam deposited £1200 in the bank. The interest rate is 4% per annum. How much will Sam earn in interest if he leaves the money in for the full year?
- 13.** We should all drink 8 glasses of water a day. What percentage of your recommended daily amount of water have you drunk if you have:
- a) 2 glasses
  - b) 4 glasses
  - c) 7 glasses

- 14.** John and Peter want to do a swim for charity. Before they start training Peter can swim 40 lengths and John 30 lengths. Peter's training increases his stamina and allows him to swim 25% more. John's training allows him to swim 50% more.
- How many lengths can they now both swim?
  - If Peter was sponsored for £1 per length and John for £1.20 per length who raised the most money?
- 15.** Torrison's the supermarket sells healthy choice ready made meals. They have 0.5 grams of fat per 100 grams. What is the percentage of fat in these meals?  
Jessie in the school canteen makes her own versions of these meals. These weigh 400 grams and have a fat content of 1.4 grams. What meal contains the least percentage of fat?
- 16.** Heather had £650; she decided to keep £350 at home and deposited the rest in the bank. The interest rate is 6% per annum. How much will Heather earn in interest if she leaves the money in for the full year? How much more would she have received if she had deposited the full amount in the bank?
- 17.** If George deposited £500 and received £25 in interest after leaving it in the bank for a year what was the percentage interest rate the bank paid?
- 18.** William can run 10 km without stopping for a rest. He wants to be able to run 12 km without stopping for a rest. What percentage must he improve his running by to be able to achieve this?