

## FIND THE AVERAGE OF:

1. 27, 53 and 46

42

2. €2.47, €2.76 and €2.96

2.73

3. 28kg, 43kg, 19kg and 54kg

36

4. 46, 56, 61, 66 and 71

60

5. 23cm, 67cm and 51cm

47

## Complete the sequences.

1. 3, 4, 5, 6, 7.

2. 7, 14, 21, 28, 35.

3.  $32^{-2}$ ,  $30^{-3}$ ,  $27^{-4}$ ,  $23^{-5}$ , 18, 12.

4. 5, 10, 20, 40, 80, 160.

5. 8, 16, 24, 32, 40, 48.

6.  $5^{+4}$ , 20, 80, 320, 1280.

7.  $2^{+2}$ ,  $4^{+4}$ ,  $8^{+6}$ ,  $14^{+8}$ , 22, 32.

8.  $3\frac{1}{2}^{+1/2}$ , 5,  $6\frac{1}{2}$ , 8,  $9\frac{1}{2}$ .

9. 7.5, 8, 8.5, 9, 9.5, 10.

10.  $12\frac{1}{2}\%$ , 25%,  $37\frac{1}{2}\%$ , 50%,  $62\frac{1}{2}\%$ .

11. 1, 2, 1, 3, 1, 4, 1, 5.

12. 1, 3, 6, 10, 15, 21. triangular

13. 20, 60, 180, 540, 1620.

14.  $5^{+2}$ ,  $7^{+3}$ ,  $10^{+4}$ ,  $14^{+5}$ , 19, 25.

15. 1, 8, 27, 64, 125, 216, 343. cubed

16.  $3\frac{1}{2}$ , 4, 4.5, 5,  $5\frac{1}{2}$ , 6, 6.5.

17. 100%,  $\frac{1}{2}$ , 0.25, 12.5%,  $\frac{1}{16}$ .

18. 1, 4, 3, 6, 5, 8, 7.

19. 1, 4, 9, 16, 25, 36. (square nos)

20. 1, 3, 9, 27, 81, 243.

## List the factors -

1. 36 1, 2, 3, 4, 6, 9, 12, 18, 36

2. 70 1, 2, 5, 7, 10, 14, 35, 70

3. 20 1, 2, 4, 5, 10, 20

4. 24 1, 2, 3, 4, 6, 8, 12, 24

# • Number

## square and cube numbers

1.	$3^2$	=	9
2.	$4^3$	=	64
3.	$5^2$	=	25
4.	$4^2$	=	16
5.	$2^2$	=	4
6.	$2^3$	=	8
7.	$10^3$	=	1000
8.	$10^2$	=	100
9.	$9^2$	=	81
10.	$9^3$	=	729
11.	$3^3 - (3 \times 4)$	=	15
12.	$12^3 \div 12$	=	144
13.	$16^2 - 13^2$	=	87
	256    169		
14.	$6^2 + 5^3$	=	161
	36    125		
15.	$7^3 \div 7$	=	49
	343		

## negative numbers

1.	$2 + 8$	=	10
2.	$-2 - 8$	=	-10
3.	$-4 - 5$	=	-9
4.	$-6 - 6$	=	-12
5.	$-10 - 1$	=	-11
6.	$-11 - 12$	=	-23
7.	$-13 - 14$	=	-27
8.	$-21 - 21$	=	-42
9.	$-3 - 3$	=	-6
10.	$-8 - 8$	=	-16
11.	$6 - 14$	=	-8
12.	$-12 + 1$	=	-11
13.	$8 - 16$	=	-8
14.	$-13 + 31$	=	18
15.	$-2 + 8$	=	6
16.	$9 - 11$	=	-2
17.	$13 - 31$	=	-18
18.	$12 - 21$	=	-9
19.	$-1 + 20$	=	19
20.	$-99 + 100$	=	1

## Simplify these fractions

$$1. \quad \frac{15}{20} = \frac{1}{4}$$

$$2. \quad \frac{4}{8} = \frac{1}{2}$$

$$3. \quad \frac{2}{12} = \frac{1}{6}$$

$$4. \quad \frac{27}{30} = \frac{9}{10}$$

$$5. \quad \frac{18}{40} = \frac{9}{20}$$

$$6. \quad \frac{14}{70} = \frac{2}{10} = \frac{1}{5}$$

$$7. \quad \frac{28}{50} = \frac{14}{25}$$

$$8. \quad \frac{15}{60} = \frac{1}{4}$$

$$9. \quad \frac{25}{100} = \frac{1}{4}$$

$$10. \quad \frac{75}{100} = \frac{3}{4}$$

$$11. \quad \frac{14}{20} = \frac{7}{10}$$

$$12. \quad \frac{60}{100} = \frac{3}{5}$$

$$13. \quad \frac{700}{1000} = \frac{7}{10}$$

$$14. \quad \frac{8000}{1,000,000} = \frac{1}{125}$$

$$15. \quad \frac{90}{180} = \frac{1}{2}$$

$$16. \quad \frac{48}{60} = \frac{4}{5}$$

$$17. \quad \frac{12}{48} = \frac{1}{4}$$

$$18. \quad \frac{16}{80} = \frac{1}{5}$$

$$19. \quad \frac{35}{100} = \frac{7}{20}$$

$$20. \quad \frac{65}{100} = \frac{13}{20}$$

## Equivalent fractions

$$1. \quad \frac{3}{4} = \frac{\boxed{12}}{16}$$

$$2. \quad \frac{2}{5} = \frac{\boxed{4}}{10}$$

$$3. \quad \frac{4}{7} = \frac{\boxed{16}}{28}$$

$$4. \quad \frac{3}{5} = \frac{6}{\boxed{10}}$$

$$5. \quad \frac{1}{2} = \frac{3}{\boxed{6}}$$

$$6. \quad \frac{\boxed{3}}{8} = \frac{9}{24}$$

$$7. \quad \frac{4}{\boxed{5}} = \frac{16}{20}$$

$$8. \quad \frac{2}{\boxed{3}} = \frac{8}{12}$$

$$9. \quad \frac{3}{\boxed{5}} = \frac{21}{35}$$

$$10. \quad \frac{5}{\boxed{10}} = \frac{100}{200}$$

$$11. \quad \frac{\boxed{12}}{48} = \frac{1}{4}$$

$$12. \quad \frac{\boxed{6}}{36} = \frac{1}{6}$$

$$13. \quad \frac{3}{4} = \frac{\boxed{75}}{100}$$

$$14. \quad \frac{1}{8} = \frac{\boxed{12}}{96}$$

$$15. \quad \frac{2}{3} = \frac{\boxed{32}}{48}$$

$$16. \quad \frac{45}{60} = \frac{3}{\boxed{4}}$$

$$17. \quad \frac{32}{40} = \frac{\boxed{4}}{5}$$

$$18. \quad \frac{16}{20} = \frac{4}{\boxed{5}}$$

$$19. \quad \frac{9}{12} = \frac{\boxed{18}}{24}$$

$$20. \quad \frac{\boxed{13}}{52} = \frac{1}{4}$$

# Angles

Name the type of angle :

1



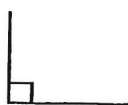
acute

2



reflex

3



right angle

4



straight

5



obtuse

Name the type of line :

6



vertical

7



parallel

8



perpendicular

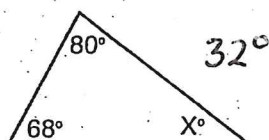
9



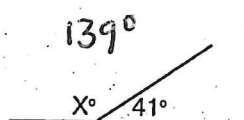
horizontal

Work out the angle x

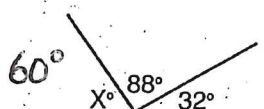
1.



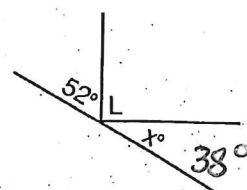
2.



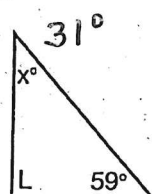
3.



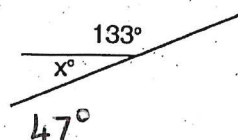
4.



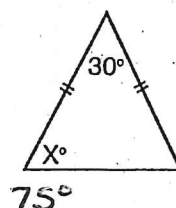
5.



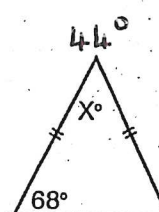
6.



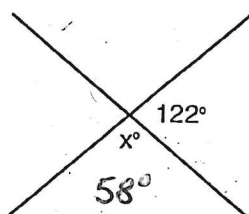
7.



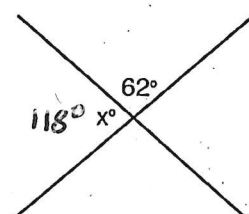
8.



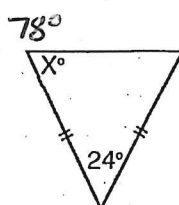
9.



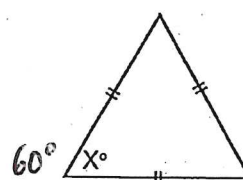
10.



11.



12.

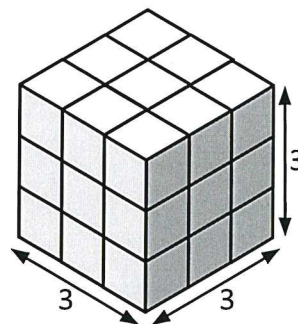


## Multiplication facts – cube numbers

A cube number is a number multiplied by itself three times.

For example, the cube of 3 is  $3 \times 3 \times 3$ , which equals 27.

We can write '3 cubed' as  $3^3$ .



1 Write these cubed numbers out as full multiplications and find the answers:

a  $1^3 =$    $\times$    $\times$    $=$

b  $4^3 =$    $\times$    $\times$    $=$

c  $2^3 =$    $\times$    $\times$    $=$

d  $5^3 =$    $\times$    $\times$    $=$

e  $0^3 =$    $\times$    $\times$    $=$

2 True or false?

a  $1^2 = 1^3$

b  $1^3 + 2^3 = 3^2$

c  $3^3 < 5^2$

d  $8^2 = 4^3$

e  $5^2 + 6^2 > 4^3$

f  $5^3 - 10^2 = 5^2$



# Mental multiplication strategies – multiply by 10s, 100s and 1,000s

When we multiply by 10 we move the number one place value to the left.

When we multiply by 100 we move the number two place values to the left.

When we multiply by 1,000 we move the number three place values to the left.

Look at how this works with the number 45:

Ten Thousands	Thousands	Hundreds	Tens	Ones	
			4	5	
		4	5	0	$\times 10$
	4	5	0	0	$\times 100$
4	5	0	0	0	$\times 1,000$

## 1 Multiply the following numbers by 10, 100 and 1,000:

a

T Th	Th	H	T	O	
			1	7	
		1	7	0	$\times 10$
	1	7	0	0	$\times 100$
1	7	0	0	0	$\times 1,000$

b

T Th	Th	H	T	O	
			4	3	
		4	3	0	$\times 10$
	4	3	0	0	$\times 100$
4	3	0	0	0	$\times 1,000$

c

T Th	Th	H	T	O	
			8	5	
		8	5	0	$\times 10$
	8	5	0	0	$\times 100$
8	5	0	0	0	$\times 1,000$

d

T Th	Th	H	T	O	
			9	9	
		9	9	0	$\times 10$
	9	9	0	0	$\times 100$
9	9	0	0	0	$\times 1,000$

## 2 Try these:

a  $14 \times 10 =$  140

b  $14 \times 100 =$  1400

c  $14 \times 1,000 =$  14,000

d  $92 \times 10 =$  920

e  $92 \times 1,000 =$  92,000

f  $92 \times 100 =$  9,200

g  $0.1 \times 1,000 =$  100

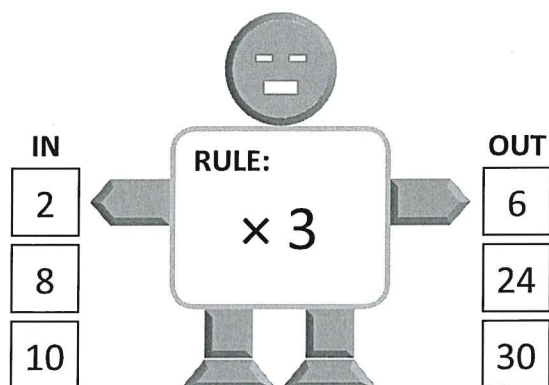
h  $0.1 \times 100 =$  10

i  $0.1 \times 10 =$  1

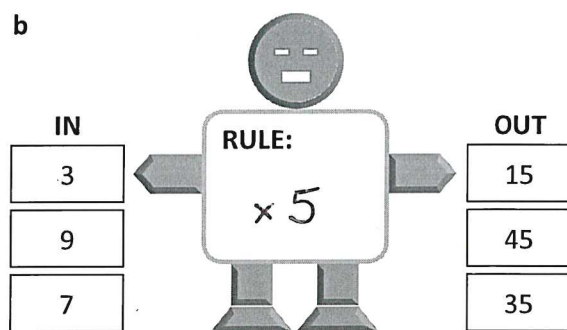
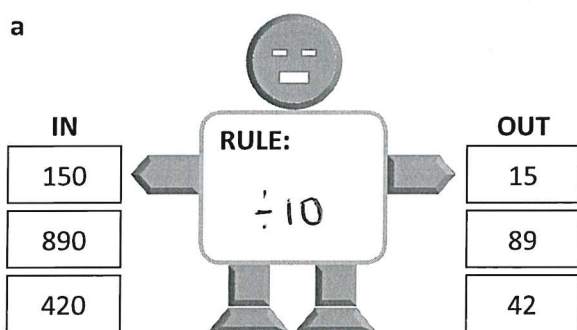
## 3 You will need a partner for this activity. Take turns giving each other $\times 10$ , $\times 100$ and $\times 1,000$ problems, such as "What is $678 \times 100$ ?" "What is $0.92 \times 1,000$ ?" Both independently work out the answer. If you are correct you get 10 points. If you disagree, ask the teacher to adjudicate. The first person to 50 points wins.

# Patterns and algebra – function machines

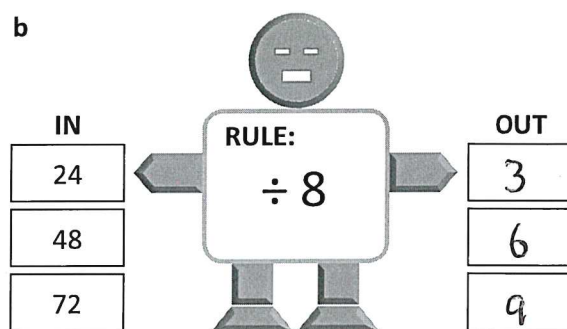
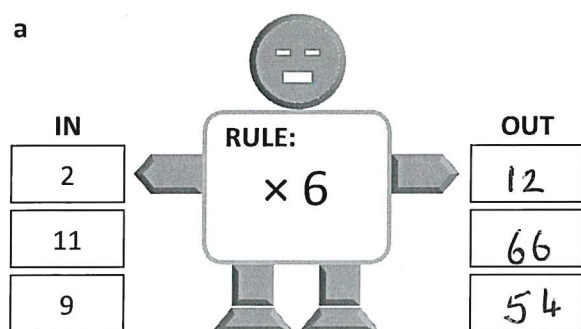
This is a function machine.  
Numbers go in, have the rule applied,  
and come out again.



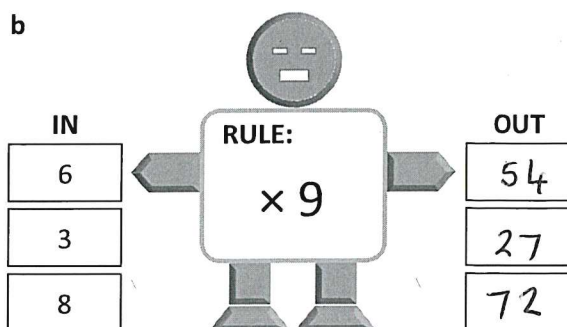
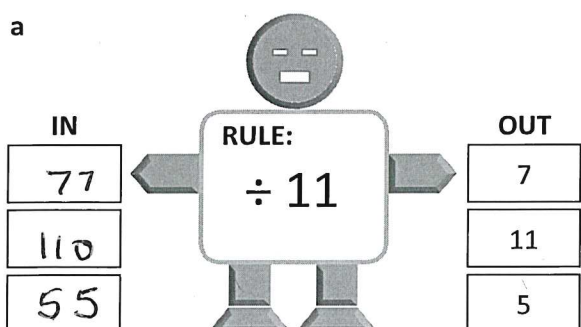
- 1 Look carefully at the numbers going *in* these function machines and the numbers coming *out*. What rule are they following each time?



- 2 What numbers will come *out* of these function machines?



- 3 What numbers go *in* to these number function machines?



## Patterns and algebra – understanding equivalence

An equation is like a set of balanced scales. Both sides are equal.  
Look at the scale on the right.

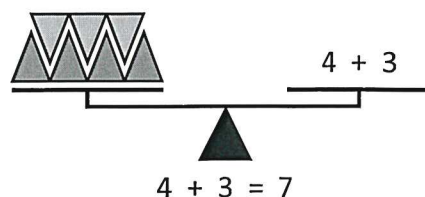
On one side are 4 black triangles and 3 grey triangles.

On the other side is the problem  $4 + 3$ .

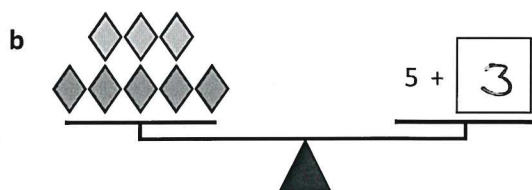
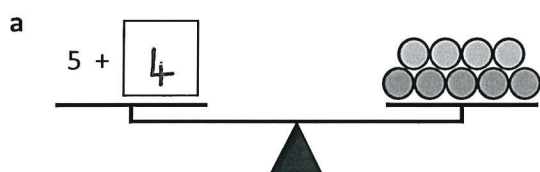
Is this a balanced equation?

Yes, because they both represent 7.

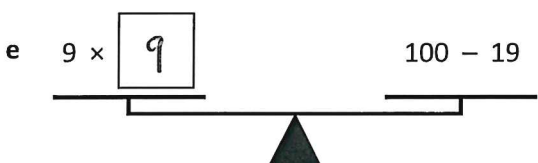
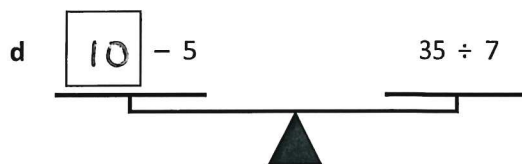
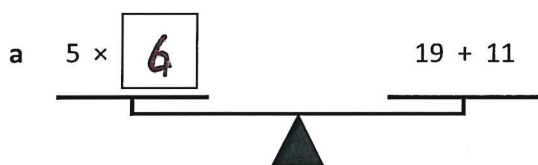
Sometimes, we haven't been given all the information and we have to work it out. This is what algebra is – solving missing number puzzles.



- 1 Make these scales balance by adding the missing value:



- 2 These scales have number problems on each side. One side has a complete problem. On the other side, you need to work out the missing value. Write the value in the box so that the scales balance:



It will help to write the answers next to each sum.



CHECK

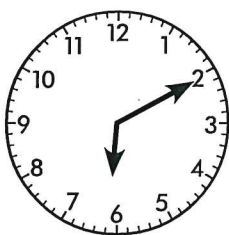
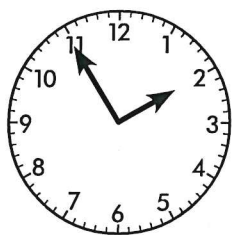


# Calculating time – elapsed time

Elapsed time is the difference between 2 different times.

To work out the difference between 2 times, first you count the hours, then you count the minutes.

1:55 to 6:10



1:55 to 5:55 = 4 hours

5:55 to 6:10 = 15 minutes

The total elapsed time is 4 hours and 15 minutes.

## 1 How much time is there between:

a Three in the afternoon and eleven that evening?

8 hours

b 6 am and 1 pm?

7 hours

c One in the morning and ten in the same morning?

9 hours

d Seven in the morning until 12:30 pm?

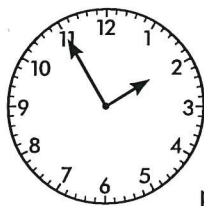
5 hrs 30 mins



THINK

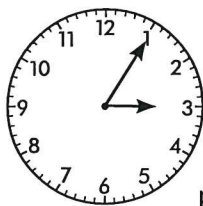
## 2 Work out the time elapsed.

a Linh arrived at a party at:



pm

She left at:



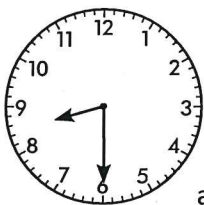
pm

She was at the party for:

70

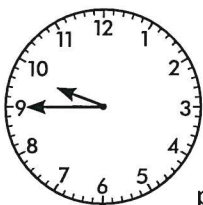
minutes

b The bus left at:



am

It arrived at:



pm

The bus trip took:

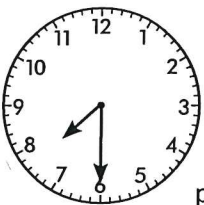
13

hours

15

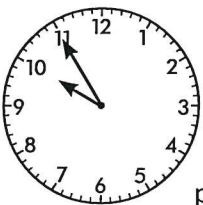
minutes

c The movie started at:



pm

It finished at:



pm

The movie went for:

2

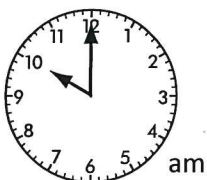

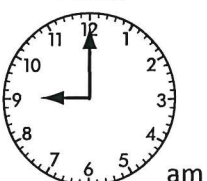

hours

25

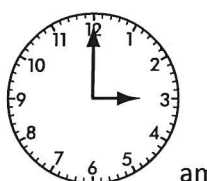



minutes

# Calculating time – elapsed time

## 3 Work out the elapsed time.

<p><b>a</b></p> <p>Start</p> <p>9:15 am</p> <p>Elapsed time:</p> <p>45 mins</p>	<p>Finish</p>  <p>am</p>	<p><b>b</b></p> <p>Start</p> <p>7:30 am</p> <p>Elapsed time</p> <p>3 hrs 30 mins</p>	<p>Finish</p>  <p>am</p>
<p><b>c</b></p> <p>Start</p> <p>4:00 pm</p> <p>Elapsed time</p> <p>17 hours</p>	<p>Finish</p>  <p>am</p>	<p><b>d</b></p> <p>Start</p> <p>2:00 am</p> <p>Elapsed time</p> <p>12 hours</p>	<p>Finish</p>  <p>pm</p>

## 4 Work out the finish time.

<p><b>a</b></p> <p>Start</p>  <p>am</p> <p>Finish</p> <p>6 : 10 am</p> <p>Elapsed time:</p> <p>3 hours 10 minutes</p>	<p><b>b</b></p> <p>Start</p>  <p>am</p> <p>Finish</p> <p>8 : 30 am</p> <p>Elapsed time:</p> <p>2 hours 25 minutes</p>
<p><b>c</b></p> <p>Start</p>  <p>am</p> <p>Finish</p> <p>2 : 45 pm</p> <p>Elapsed time:</p> <p>6 hours 15 minutes</p>	<p><b>d</b></p> <p>Start</p>  <p>pm</p> <p>Finish</p> <p>1 : 45 am</p> <p>Elapsed time:</p> <p>4 hours 30 minutes</p>

## 5 Being able to count forward in intervals is an important skill.

Finish each time trail:

a	Count on in 15 minutes	9:30	9:45	10:00	10:15	10:30	10:45	11:00
b	Count on in 10 minutes	7:42	7:52	8:02	8:12	8:22	8:32	8:42
c	Count on in 15 minutes	6:47	7:02	7:17	7:32	7:47	8:02	8:17
d	Count on in 10 minutes	2:53	3:03	3:13	3:23	3:33	3:43	3:53

# Calculating time – elapsed time

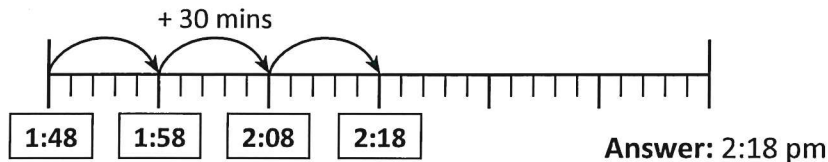
A time line can help us with more difficult elapsed time problems.

**Question:** A party started at 12:48 pm and went for 1 hour and 30 minutes. What time did it finish?

- Steps:**
1. First count on in hours in your head and write that answer in the first box on the time line.
  2. Use the time line to count on in minutes. Each small marker represents 2 minutes. Each large marker represents 10 minutes.



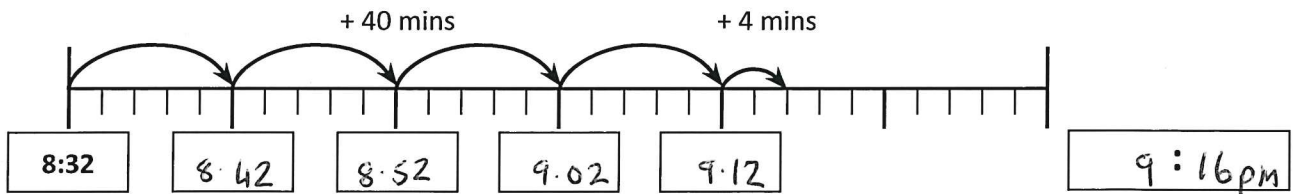
**REMEMBER**



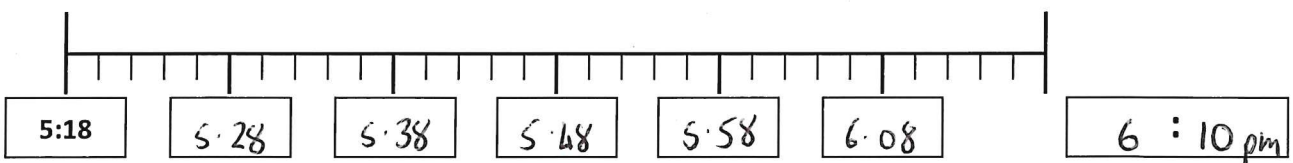
**Answer:** 2:18 pm

## 6 Use the time line for each elapsed time problem:

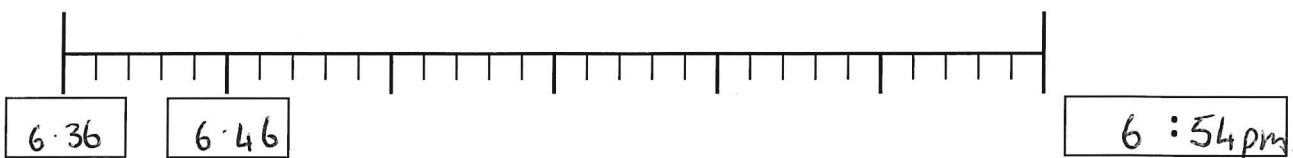
- a Abdul played the clarinet from 7:32 pm for 1 hour and 44 minutes. What time did he finish?



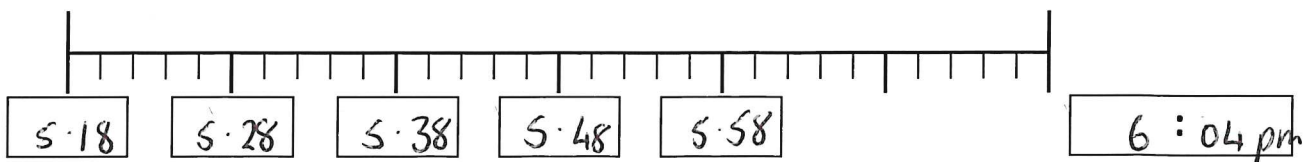
- b Ali took 3 hours and 52 minutes to wash 12 cars. If she started at 2:18 pm, what time did she finish?



- c Sarah drove to her friend Nick's house. She left her house at 4:36 pm and the drive took 2 hours and 18 minutes. What time did she arrive?



- d In order to buy and prepare all the food for the birthday party, Max worked solidly from 2:18 pm for 3 hours and 46 minutes. What time did he stop?



# Timetables – measuring time

Timetables are often used to schedule public transport.

1 Use the timetable to answer the questions below:

Station	Time				
Burwood	5:20	5:27	5:50	7:17	8:26
Croydon	-	-	6:00	7:27	8:36
Ashfield	5:35	5:42	6:05	7:32	8:41
Summer Hill	-	6:12	7:39	8:48	8:53
Lewisham	5:48	5:55	6:18	7:45	8:54

- a What time does the 10 to 6 train from Burwood arrive at Ashfield?
- b I have just missed the 5:35 train from Ashfield. How long do I have to wait until the next train?
- c I live in Croydon and I want to get to Lewisham by 6:30. Which train should I get?

6:05

7 mins.

6:00

2 Answer the questions below about this TV guide:

Time	7:00–8:00 pm	8:00–9:00 pm	9:00–10:00 pm	10:00–11:00 pm
Channel 1	News	Current Affairs	Soccer Finals	Late News
Channel 2	Days of Us	Fashion Watch	TV Bloopers	Movie: Ghost Busters
Channel 3	News	History of Gold	The Car Show	Late Night Movie

- a What time does Current Affairs on Channel 1 start?
- b How long is the History of Gold on Channel 3?
- c How long do the Soccer Finals go for?
- d What time does TV Bloopers start?
- e Alicia watches too much TV. If she watched Fashion Watch, TV Bloopers and then the movie Ghost Busters, how long was she in front of the box for?

8:00pm

1 hour

1 hour

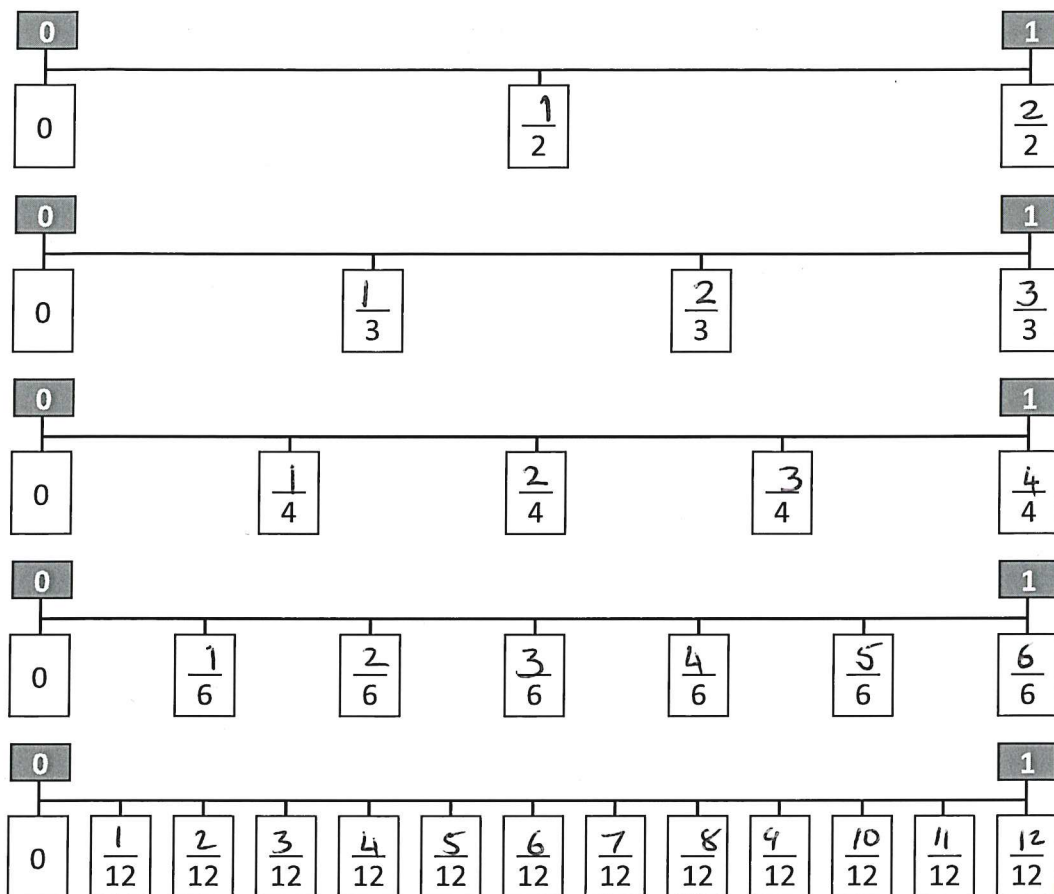
8:30pm

2 hours



# Fractions – comparing and ordering fractions

4 Label the missing fractions on the number line:



5 Are these statements true or false? Use the number lines above to help you with your decision. Remember the large end < eats the large number.

a  $\frac{1}{3} < \frac{1}{2}$

T

b  $\frac{1}{4} > \frac{2}{6}$

F

c  $\frac{1}{2} > \frac{1}{3}$

T

d  $\frac{1}{4} < \frac{5}{12}$

T

e  $\frac{3}{4} > \frac{7}{12}$

T

f  $\frac{2}{3} > \frac{3}{4}$

F

g  $\frac{7}{12} > \frac{1}{4}$

T

h  $\frac{3}{12} > \frac{1}{6}$

T

6 Use the number lines above to help you put these fractions in order from smallest to largest:

a  $\frac{8}{12}$   $\frac{1}{2}$   $\frac{2}{6}$

$\frac{2}{6}$   $\frac{1}{2}$   $\frac{8}{12}$

b  $\frac{1}{4}$   $\frac{2}{6}$   $\frac{1}{12}$

$\frac{1}{12}$   $\frac{1}{4}$   $\frac{2}{6}$

c  $\frac{3}{4}$   $\frac{1}{2}$   $\frac{5}{12}$

$\frac{5}{12}$   $\frac{1}{2}$   $\frac{3}{4}$

d  $\frac{5}{6}$   $\frac{1}{3}$   $\frac{1}{4}$

$\frac{1}{4}$   $\frac{1}{3}$   $\frac{5}{6}$

# Fractions, decimals and percentages – ordering decimals to 3 decimal places

To compare and order decimals, always start by looking at the digit on the left side of the number.

For example, if we want to know which is bigger 5.2 or 3.9, we look at the left digit in each number and can see that 5 is bigger than 3, so 5.2 is bigger than 3.9.

We only need to look at the next digit if the first is the same. So if we are comparing 7.66 and 7.83, we can see that the first digits in each number are the same, so we need to compare the following digits. As 8 is bigger than 6, we know that 7.8 is bigger than 7.6. The third digit doesn't matter.

If the first two digits are the same, then you need to move on to compare the third, and so on.

## 1 Order these decimals from smallest to largest:

a 3.04 4.03 3.34 3.43 3.4

3.04	3.34	3.4	3.43	4.03
------	------	-----	------	------

b 7.673 7.376 7.637 7.763 7.736

7.376	7.637	7.673	7.736	7.763
-------	-------	-------	-------	-------

c 89.978 98.987 98.899 89.879 89.789

89.789	89.879	89.978	98.899	98.987
--------	--------	--------	--------	--------

## 2 True or false?

a  $3.034 > 3.043$

F

b  $732.35 < 732.53$

T

c  $0.010 < 0.009$

F

d  $13.200 = 13.2$

T

e  $17.171 < 17.717$

T

f  $2,020.202 > 2,020.022$

T

## Fractions, decimals and percentages – rounding decimals

Rounding decimals follows the same rules as rounding any number. If the key digit is between 1 and 4 you round down; if it is between 5 and 9 you round up.

The key digit will be the one to the right of the digit to which you are rounding. If you are rounding a number to the nearest one, you focus on the 'tenth' digit; if rounding to one decimal place (the nearest tenth), then the 'hundredth' digit is the key one. So,

3.48 rounded to the nearest one is 3 as the '4' rounds down.

3.48 rounded to one decimal place is 3.5 as the '8' rounds up.

1 Round the following numbers to the nearest one:

a 4.29

4

b 8.72

9

c 27.51

28

d 75.48

75

e 999.52

1,000

f 7,687.73

7,688

2 Round the following numbers to one decimal place (the nearest tenth):

a 9.36

9.4

b 0.45

0.5

c 69.29

69.3

d 86.66

86.7

e 538.44

538.4

f 2,972.86

2972.9

3 The following numbers have been rounded to one decimal place. What number with two decimal places might they have been originally?

open.

a 8.3

b 17.8

c 67.1

d 569.6

e 3,829.4

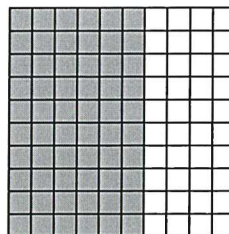
f 72,853.9

# Fractions, decimals and percentages – percentages

Percent means part per hundred and is expressed using the symbol %.

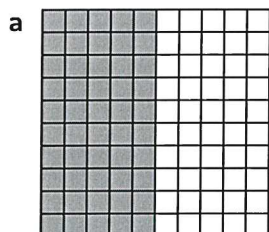
Here, 60% has been shaded grey.

It is the same as 60 hundredths.  $\frac{60}{100} = 0.60 = 60\%$

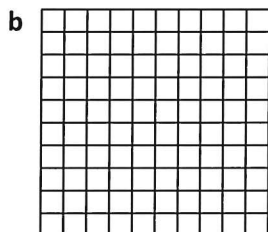


- 1 Think of at least five times you see the % sign or use percentages:

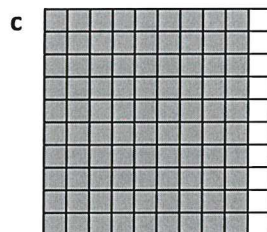
- 2 Fill in the missing values and shade the grids:



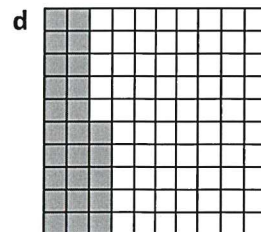
$\frac{50}{100}$  0.5 50%



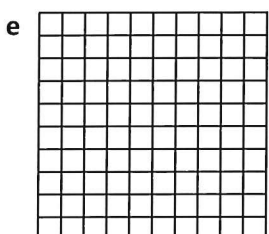
$\frac{30}{100}$  0.3 30%



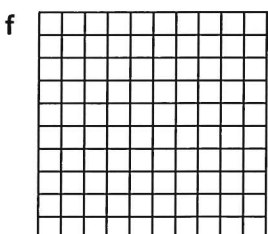
$\frac{90}{100}$  0.90 90%



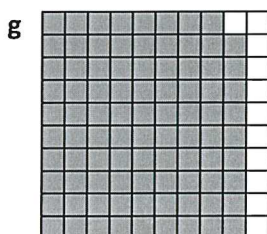
$\frac{25}{100}$  0.25 25%



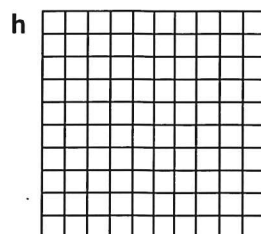
$\frac{45}{100}$  0.45 45%



$\frac{75}{100}$  0.75 75%



$\frac{89}{100}$  0.89 89%



$\frac{42}{100}$  0.42 42%

- 3 Are these statements correct?

a 75% is greater than 0.5

T

b One quarter is the same as 50%

F

c 45% is greater than 0.5

F

d 0.42 is equivalent to 425

F

e You score 100% on a test. Your friend scores 20/20. You both received the same score.

T





# Fractions, decimals and percentages – introducing percentages

1 Often you can see percentages in shops when it is sale time. Work out the sale price of these items:

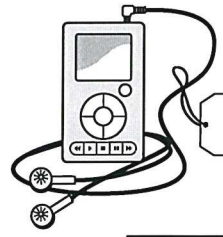


a  £50  
Sale price: £25

b  £24  
Sale price: £12

c  £60  
Sale price: £30

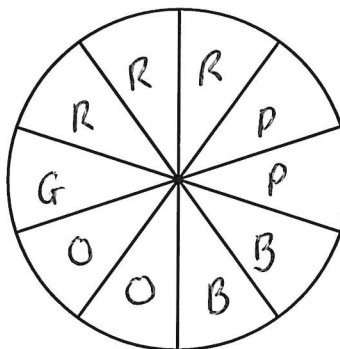
d  £30  
Sale price: £15

e  £200  
Sale price: £100

2 Pie charts are used to show information clearly and are often colour coded. Complete the pie charts according to the information. Each whole pie chart is 100% and each segment is 10%. Choose a colour for each bit of information.

a 100 people were surveyed about their favourite weekend activities.

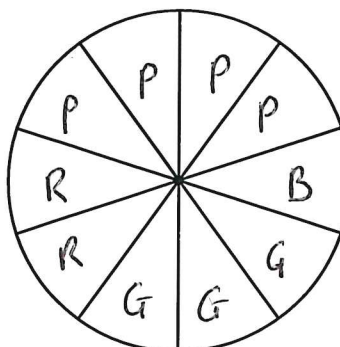
- R Go to a restaurant ..... 30%
- G Go to the beach ..... 10%
- O See a movie ..... 20%
- B Go shopping ..... 20%
- P Play sport ..... 20%



A percentage is an amount out of 100, so  $\frac{60}{200}$  would be the same as  $\frac{30}{100}$ .

b 200 people were surveyed about their favourite food.

- P Pizza ..... 80
- R Hamburgers ..... 40
- G Pasta ..... 60
- B Curry ..... 20



THINK

# Fractions, decimals and percentages – word problems

## 1 Solve these word problems:

- a In a Year 5 class, half of the pupils walk to school, 30% take the bus and the remaining children walk. Express the fraction of the class who walk as a decimal.

0.2

- b In a talent contest, Jerry gets  $\frac{2}{5}$  of the vote. What percentage of people didn't vote for him?

60%

- c I share an extra large pizza with my friend for lunch. I eat  $\frac{3}{5}$  of it, and he eats  $\frac{3}{10}$ . What percentage of the pizza is left?

10%

- d In a sale a coat is marked as 50% off. If it's original price was £45.00, how much does it cost in the sale?

22.50

- e A carpenter is making a piece of furniture. He needs 6 pieces of wood 250 mm long. If he cuts them from a piece 2,000 mm long, what fraction of this piece will be left over?

$\frac{1}{4}$

- f I love chocolate. My mum buys a big bar and says I can have  $\frac{1}{8}$ , 10% or 0.12 of the bar. Which of these will give me the most chocolate?

$\frac{1}{8}$

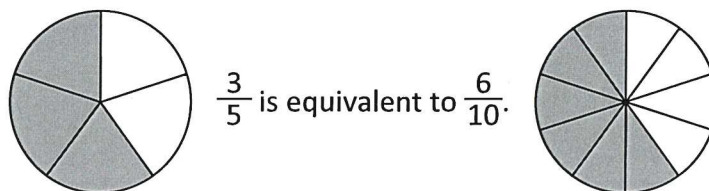
- g In an interview an athlete says "I put 110% effort into that race." What is wrong with that statement?

100% is the maximum effort possible

# Calculating – adding and subtracting fractions with denominators that are multiples of the same number

If we need to add and subtract fractions whose denominators are multiples of the same number, we have first to make the denominators the same.

So, if we want to find  $\frac{3}{5} + \frac{3}{10}$  we need to look at the denominators. Both 5 and 10 are multiples of 5, so we need to convert the fraction with the smaller denominator into tenths. To do this we multiply both numerator and denominator by 2.



Now we can work out  $\frac{6}{10} + \frac{3}{10}$  by adding the numerators. The answer is  $\frac{9}{10}$ .

## 1 Solve these problems:

$$\text{a } \frac{2}{3} + \frac{1}{6} = \frac{\boxed{4}}{\boxed{6}} + \frac{\boxed{1}}{\boxed{6}} = \frac{\boxed{5}}{\boxed{\phantom{00}}}$$

$$\text{b } \frac{2}{9} + \frac{1}{3} = \frac{\boxed{2}}{\boxed{9}} + \frac{\boxed{3}}{\boxed{9}} = \frac{\boxed{5}}{\boxed{9}}$$

$$\text{c } \frac{4}{5} - \frac{1}{10} = \frac{\boxed{8}}{\boxed{10}} - \frac{\boxed{1}}{\boxed{10}} = \frac{\boxed{7}}{\boxed{10}}$$

$$\text{d } \frac{2}{3} - \frac{7}{12} = \frac{\boxed{8}}{\boxed{12}} - \frac{\boxed{7}}{\boxed{12}} = \frac{\boxed{1}}{\boxed{12}}$$

## 2 Solve these problems. Change any improper fractions into mixed numbers.

$$\text{a } \frac{3}{7} + \frac{9}{14} = \frac{\boxed{6}}{\boxed{14}} + \frac{\boxed{9}}{\boxed{14}} = \frac{\boxed{15}}{\boxed{14}} = \boxed{1} \frac{\boxed{1}}{\boxed{14}}$$

$$\text{b } \frac{3}{4} - \frac{1}{3} = \frac{\boxed{9}}{\boxed{12}} - \frac{\boxed{4}}{\boxed{12}} = \frac{\boxed{5}}{\boxed{12}}$$

$$\text{c } \frac{7}{18} + \frac{2}{3} = \frac{\boxed{7}}{\boxed{18}} + \frac{\boxed{12}}{\boxed{18}} = \frac{\boxed{19}}{\boxed{18}} = \boxed{1} \frac{\boxed{1}}{\boxed{18}}$$

When you add or subtract fractions with the same denominator, only the numerator changes.



THINK