

# Fractions, Decimals and Percentages

# GCSE MATHS

Name: \_\_\_\_\_

Teacher: \_\_\_\_\_

## Learning objectives

### By the end this pack you will be able to:

1. –Convert between Fractions, Decimals and Percentages
2. Simplify fractions

FRACTION – DECIMAL MATCH

Pair up the fractions and decimals from the grid.

0.1	$\frac{1}{2}$	0.25	0.67	$\frac{2}{5}$
0.2	$\frac{3}{10}$	0.3	$\frac{1}{3}$	0.75
$\frac{2}{3}$	$\frac{7}{10}$	$\frac{1}{5}$	0.4	$\frac{3}{4}$
0.33	$\frac{1}{4}$	0.5	$\frac{1}{10}$	0.7

CONVERTING DECIMALS

Change each decimal to a fraction and write it in its' simplest form

1. 0.3                      2. 0.8                      3. 0.12                      4. 0.15                      5. 0.9
6. 0.35                      7. 0.24                      8. 0.04                      9. 0.124                      10. 0.125

CONVERTING FRACTIONS

1. Use a calculator to change each fraction to a decimal. Write down the full calculator display.

- a)  $\frac{3}{8}$                       b)  $\frac{5}{12}$                       c)  $\frac{4}{25}$                       d)  $\frac{7}{9}$                       e)  $\frac{3}{20}$                       f)  $\frac{9}{16}$                       g)  $\frac{17}{40}$

EXAM QUESTIONS

1. (a) Write 0.25 as a fraction.  
 (b) Write three-fifths as a decimal.  
 (c) Write  $\frac{9}{100}$  as a decimal.
2. (a) Write  $1\frac{1}{8}$  as a decimal.  
 (b) Place the following numbers in order of size, starting with the smallest.

$$1\frac{1}{8} \quad 1.08^2 \quad 1.09 \quad 1.112 \quad 1.18$$

EQUIVALENT FRACTIONS

1. Write down five fractions that are equivalent to:

- a)  $\frac{1}{4}$                       b)  $\frac{1}{5}$                       c)  $\frac{1}{6}$                       d)  $\frac{1}{8}$

2. Fill in the missing numbers:

- a)  $\frac{1}{2} = \frac{\quad}{10}$                       b)  $\frac{1}{3} = \frac{5}{\quad}$                       c)  $\frac{2}{3} = \frac{10}{\quad}$                       d)  $\frac{2}{7} = \frac{\quad}{21}$
- e)  $\frac{2}{5} = \frac{\quad}{20}$                       f)  $\frac{10}{30} = \frac{1}{\quad}$                       g)  $\frac{15}{20} = \frac{3}{\quad}$                       h)  $\frac{12}{24} = \frac{1}{\quad}$

SIMPLIFYING FRACTIONS

Write each fraction in its' simplest form.

1.  $\frac{3}{9}$                       2.  $\frac{8}{40}$                       3.  $\frac{9}{12}$                       4.  $\frac{12}{18}$                       5.  $\frac{15}{35}$

ORDERING FRACTIONS

1. Copy the questions and circle the fraction that is the largest?

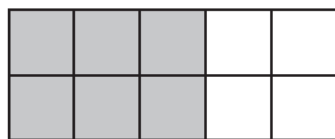
- a)  $\frac{1}{3}$  or  $\frac{1}{4}$                       b)  $\frac{1}{3}$  or  $\frac{1}{6}$                       c)  $\frac{1}{3}$  or  $\frac{2}{7}$
- d)  $\frac{1}{2}$  or  $\frac{1}{3}$                       e)  $\frac{5}{8}$  or  $\frac{3}{4}$                       f)  $\frac{6}{7}$  or  $\frac{7}{9}$
- g)  $\frac{1}{2}$  or  $\frac{1}{5}$                       h)  $\frac{2}{7}$  or  $\frac{3}{8}$                       i)  $\frac{4}{6}$  or  $\frac{2}{5}$

2. Write each list in order from smallest to biggest.

- a)  $\frac{1}{4}$  ,  $\frac{1}{8}$  ,  $\frac{1}{10}$  ,  $\frac{1}{5}$                       e)  $\frac{1}{8}$  ,  $\frac{1}{5}$  ,  $\frac{1}{2}$  ,  $\frac{1}{10}$
- b)  $\frac{1}{3}$  ,  $\frac{1}{2}$  ,  $\frac{1}{8}$  ,  $\frac{1}{4}$                       f)  $\frac{3}{8}$  ,  $\frac{1}{5}$  ,  $\frac{2}{4}$  ,  $\frac{9}{10}$
- d)  $\frac{1}{2}$  ,  $\frac{1}{10}$  ,  $\frac{1}{3}$  ,  $\frac{1}{5}$                       h)  $\frac{2}{7}$  ,  $\frac{1}{5}$  ,  $\frac{2}{3}$  ,  $\frac{2}{9}$
- f)  $\frac{3}{8}$  ,  $\frac{1}{5}$  ,  $\frac{2}{4}$  ,  $\frac{9}{10}$                       j)  $\frac{2}{7}$  ,  $\frac{1}{4}$  ,  $\frac{3}{9}$  ,  $\frac{3}{8}$  ,  $\frac{2}{5}$

EXAM QUESTION

1. What fraction of this shape is shaded?  
Give your answer in its simplest form.



2. Which **two** of these fractions are equivalent to  $\frac{1}{4}$ ?

- $\frac{2}{8}$                        $\frac{5}{16}$                        $\frac{6}{24}$                        $\frac{11}{40}$

FRACTIONS OF AMOUNTS

Work out all these fractions of 60

$$\frac{1}{2}$$

$$\frac{1}{3}$$

$$\frac{1}{4}$$

$$\frac{2}{4}$$

$$\frac{1}{6}$$

$$\frac{1}{12}$$

$$\frac{3}{12}$$

$$\frac{6}{12}$$

$$\frac{2}{6}$$

$$\frac{2}{12}$$

$$\frac{4}{12}$$

$$\frac{4}{10}$$

$$\frac{3}{6}$$

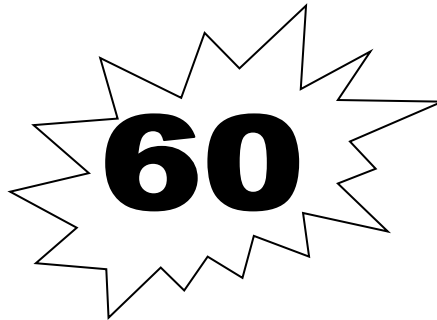
$$\frac{1}{10}$$

$$\frac{2}{10}$$

$$\frac{5}{10}$$

$$\frac{1}{5}$$

$$\frac{2}{5}$$

EXAM QUESTIONS

- Tom works 12 hours each week.  
He earns £4 per hour.  
Tom saves  $\frac{1}{3}$  of his earnings each week.  
How many weeks does it take Tom to save £80?  
You **must** show all your working.
- Find  $\frac{7}{10}$  of £50
- $\frac{3}{4}$  of 200
- Beth picks 400 roses and takes them to a local market.  
  
Beth sells  $\frac{4}{5}$  of the roses.  
  
How many roses does Beth sell?
- There are 800 pupils at a school.  
  
Of these 800 pupils,  $\frac{1}{10}$  are under 12, and  $\frac{1}{5}$  are over 16.  
  
(a) How many pupils are **not** under 12 **and** are **not** over 16?

ADDING AND SUBTRACTING FRACTIONS

1. Fill in the boxes by adding the fractions.

<b>+</b>	$\frac{1}{3}$	$\frac{2}{5}$	$\frac{3}{8}$	$\frac{2}{7}$
$\frac{1}{2}$				
$\frac{2}{3}$				

2. Work out each question without a calculator. Show your working and write your answer in its' simplest form.

a)  $\frac{1}{4} + \frac{3}{5}$       b)  $\frac{3}{5} - \frac{1}{3}$       c)  $\frac{1}{9} + \frac{1}{10}$       d)  $\frac{3}{4} - \frac{1}{6}$

3. Work out each question with a calculator.

a)  $\frac{3}{4} + \frac{3}{15}$       b)  $\frac{7}{10} - \frac{2}{3}$       c)  $\frac{7}{9} + \frac{7}{10}$       d)  $\frac{13}{15} - \frac{9}{20}$

EXAM QUESTIONS

1. Heather is revising fractions for her homework.  
This is how she answers one of the questions.

$$\frac{1}{2} + \frac{1}{3} = \frac{2}{5}$$

Heather is wrong.

Show the correct way to work out  $\frac{1}{2} + \frac{1}{3}$

2. Work out  $\frac{1}{2} + \frac{1}{5}$
3. Tom has £2 200.  
He gives  $\frac{1}{4}$  to his son and  $\frac{2}{5}$  to his daughter.  
How much does Tom keep for himself?  
You **must** show all your working.
4. Work out  $\frac{3}{5} - \frac{1}{3}$
5. Calculate  $\frac{5}{8} - \frac{1}{4}$
6.  $\frac{3}{4} - \frac{1}{5}$
7. Work out the value of  $\frac{2}{5} + \frac{1}{4}$

MULTIPLYING FRACTIONS

Fill in the boxes by multiplying the fractions.

<b>X</b>	$\frac{1}{3}$	$\frac{2}{5}$	$\frac{3}{8}$	$\frac{2}{7}$
$\frac{1}{2}$				
$\frac{2}{3}$				

MIXED NUMBERS

1.  $1\frac{1}{2} + 2\frac{3}{5}$

2.  $3\frac{2}{5} - 1\frac{1}{2}$

3.  $2\frac{2}{3} \times 3\frac{1}{4}$

DIVIDING WITH FRACTIONS

1.  $\frac{1}{2} \div \frac{1}{4}$

2.  $\frac{2}{5} \div \frac{1}{10}$

3.  $\frac{3}{4} \div \frac{3}{8}$

4.  $\frac{3}{10} \div \frac{1}{5}$

5.  $\frac{7}{9} \div \frac{3}{4}$

EXAM QUESTIONS

1. Linda uses  $\frac{3}{5}$  of a tin of paint to paint a fence panel.

What is the **least** number of tins she needs to paint 8 fence panels?

2. On Monday Joe drinks  $2\frac{1}{3}$  pints of milk.

On Tuesday he drinks  $1\frac{3}{4}$  pints of milk.

Work out the total amount of milk that Joe drinks on Monday and Tuesday.

3.  $\frac{2}{5} \times \frac{1}{4}$  ,  $\frac{1}{3} \times \frac{4}{5}$

4. Work out  $\frac{3}{7} \times 28$

5. Work out  $\frac{3}{5} \div 6$

6. Fill in the boxes to make these statements correct.

(i)  $\frac{1}{5} \times \square = 1$

(ii)  $\frac{3}{4} \times \frac{\square}{\square} = 1$

7. Work out  $4\frac{1}{3} - 1\frac{2}{5}$

Work out  $2\frac{4}{5} + 3\frac{2}{3}$

FRACTIONS, DECIMALS AND PERCENTAGES

1. Copy and complete the table.

Fraction	Percentage	Decimal
$\frac{4}{10}$		
	10%	
$\frac{2}{5}$		
		0.80
	25%	
$\frac{3}{20}$		
	20%	
		0.10
	5%	
$\frac{1}{4}$		
		0.05

2. Change each fraction to a percentage:

- a)  $\frac{1}{2}$       b)  $\frac{7}{10}$       c)  $\frac{9}{20}$       d)  $\frac{3}{4}$

3. Change each decimal to a fraction:

- a) 0.4      b) 0.9      c) 0.35      d) 0.65

4. Change each percentage to a fraction:

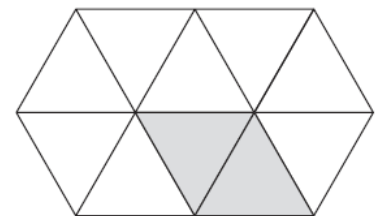
- a) 60%      b) 15%      c) 12%      d) 32%

EXAM QUESTIONS

1 Complete the table below.

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	
	0.7	70%
$\frac{3}{100}$		3%

2 This diagram is made from equilateral triangles.



(i) What percentage of the diagram is shaded?

PERCENTAGES OF AMOUNTS

	300	220	140	260	360	500	800	90	130
5%									
10%									
15%									
20%									
25%									
30%									
40%									
45%									
50%									
60%									
70%									
90%									

WHAT PERCENTAGE?

- |                                 |                                 |
|---------------------------------|---------------------------------|
| 1. What percentage of 50 is 5?  | 2. What percentage of 20 is 8?  |
| 3. What percentage of 90 is 27? | 4. What percentage of 70 is 35? |
| 5. What percentage of 80 is 48? | 6. What percentage of 60 is 42? |

EXAM QUESTIONS

1. Kath knows a quick way to work out 15% of any amount of money.

To work out 15% of £160

*10% of £160 = £16*  
*So 5% of £160 = £8*  
*So 15% of £160 = £24*



Use Kath's method to work out 15% of £420.

- 2.

60% of £40

$\frac{2}{5}$  of £55

Which is the larger amount?  
 You **must** show your working.

3. Find 30% of 200 metres.
4. 10% of £6.50



PERCENTAGE INCREASE AND DECREASE

1. Increase £90 by 10%
2. Increase £110 by 50%
3. Increase £120 by 5%
4. Decrease £40 by 20%
5. Decrease £700 by 30%
6. Decrease £320 by 5%
7. Increase £620 by 25%
8. Decrease £180 by 60%

EXAM QUESTIONS

1. Miss Evans earns £240 per week.  
She is awarded a pay rise of 3.5%.  
How much does she earn each week after the pay rise?
2. Mr and Mrs Smith are buying a washing machine.



How much do they pay for the washing machine?

3. During 2003 the number of people out of work in Barnsley fell by 8%.  
At the end of the year there were 2576 people out of work in Barnsley.  
How many people were out of work at the beginning of the year?
4. John also buys an ink cartridge which costs \$25.  
He has to pay a tax of 6% which is added onto this cost.  
  
Calculate the total cost of the ink cartridge in \$.