Year 10

Set 2

Summer Work 2018

GCSE Preparation

Name: _____

Due: Friday 7th September

Answer in your homework book.

CALCULATIONS

BEST VALUE - EXAM QUESTIONS

1. The same type of crystal glasses is sold in two different packs.

Small pack	Large pack
Contents 4 glasses	Contents 12 glasses
£3.20	£10.20

Which size is the better value for money?

You **must** show your working.

2. A garden centre has tomato plants for sale.

Tomato plants
40 pence each or £5 for a box of 20

Work out the cheapest price for 24 tomato plants.

3. Two advertisements for the same type of sun oil are shown.
The sun oil is usually sold in 100 ml bottles which cost £4 each.

Which offer gives the better value for money?
You **must** show all your working.

SPEED, DISTANCE AND TIME - EXAM QUESTIONS

1. Alan drove 12 miles.
The journey took 15 minutes.

What was Alan's average speed?

2. Charles drove 132 miles at an average speed of 55 mph.
Calculate the time taken for this journey.

Give your answer in hours and minutes.

3. (a) An athlete runs 15 miles at an average speed of 6 miles per hour.

How long does he take to run the 15 miles?
Give your answer in hours and minutes.

(b) Another athlete runs 18 miles in $2\frac{1}{4}$ hours.

What is her average speed?

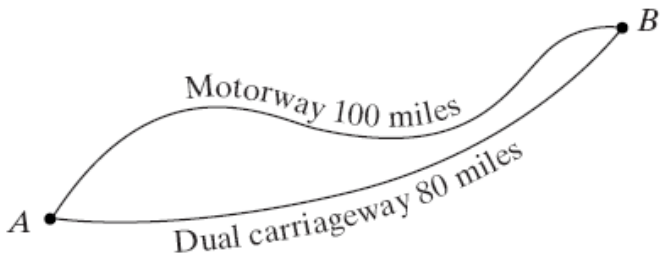
4. Sally drove 120 miles at an average speed of 50 mph.

Calculate the time taken for this journey.
Give your answer in hours and minutes.

5. Kristen drives 252 miles from Redcar to London in 4 hours and 30 minutes.

Calculate her average speed in miles per hour.

6. Two towns, A and B, are connected by a motorway of length 100 miles and a dual carriageway of length 80 miles as shown.



Jack travels from A to B along the motorway at an average speed of 60 mph.
Fred travels from A to B along the dual carriageway at an average speed of 50 mph.
What is the difference in time between the two journeys?
Give your answer in minutes.

NUMBER PROBLEMS 1
EXAM QUESTIONS

1. Chris pays €18 for a meal.
The exchange rate is £1 = €1.60

What is the price of the meal in pounds?

2. In the USA, a leather jacket costs $96.
The exchange rate is $1.60 to £1.

Find the cost of the jacket in £.

3. In the Czech Republic, Boris pays 922 korunas for a meal.
The exchange rate is 49.1 korunas to £1.

What is the cost of the meal in pounds?

4. Dave drives 15 miles to work.
The journey takes 20 minutes.

What is Dave's average speed in miles per hour?

5. While in the USA, John pays $30 for a pair of trainers.
The exchange rate is $1.50 to £1.

Calculate the cost of the pair of trainers in £.

6. Apples are sold in a farm shop at £1.76 per kilogram.

Calculate the price of 1 pound of apples.

Use the conversion 1 kilogram = 2.2 pounds

7. In Portugal, Brian spends €2.80 on ice cream.
This price includes VAT which is 12% in Portugal.

Find the amount of VAT which Brian paid.

NUMBER PROBLEMS 2
EXAM QUESTIONS

1. Yasmin worked for $4\frac{1}{2}$ hours each day.
In one week she worked 6 days and was paid £10 per hour.

How much did Yasmin earn in that week?

2. Tom works from 1.45 pm to 5.30 pm every weekday.

(a) How long does Tom work each day?

(b) On Saturday Tom works $6\frac{1}{2}$ hours.
He is paid £5.40 per hour.

How much is Tom paid for Saturday's work?

3. In the summer, Nisha sells ice creams on the beach.
She is paid £3 per hour and 5p for every ice cream which she sells.
On one day, Nisha works 4 hours and sells 200 ice creams.

How much is she paid for that day?

4. (a) Jake earns £4 an hour for a basic 35 hour week.
He earns £6 an hour for overtime.
One week he works the basic 35 hour week and 2 hours overtime.

How much does he earn altogether?

(b) One morning, Jake works from 0815 to 1210.

How long does he work?
Give your answer in hours and minutes.

5. Sara is paid £5.10 per hour.
Each day she works $7\frac{1}{2}$ hours.
Each week she works 5 days.

How much does she earn each week?

NUMBER PROBLEMS 3
EXAM QUESTIONS

1. Rick buys a drink costing £1.35 and some packets of sweets costing 65 pence for each packet.
The total cost is £3.95

How many packets of sweets does Rick buy?

2. Nicole buys 2.3 kg of apples and 1.8 kg of plums.
She pays £7.18 in total.
The plums cost £2.20 per kg.

What is the cost of 1 kg of apples?
Show your working.

3. A trader pays £14.80 for 20 melons.

How much does he pay for one melon?

4.

First class railway coaches have 28 seats.
Standard class railway coaches have 48 seats.

(a) A train has 3 first class coaches and 12 standard class coaches.

How many seats are there on the train altogether?

(b) Another train has 620 seats.
This train has 10 standard class coaches.

How many first class coaches does it have?

5. Mike took 400 books to sell at a Saturday market.
By 3 pm, he had sold 310 books at 80 pence each.

Mike then reduced the selling price of the remaining books to 50 pence each.
He was left with 24 unsold books which he gave away.

Find the total amount Mike received from selling the books.

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.

$$1\tfrac{1}{8} \qquad 1.08^2 \qquad 1.09 \qquad 1.112 \qquad 1.18$$

EQUIVALENT FRACTIONS

1. Write down five fractions that are equivalent to:

a) $\frac{1}{4}$ b) $\frac{1}{8}$ c) $\frac{3}{8}$ d) $\frac{3}{4}$

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) $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{10}$, $\frac{1}{5}$

b) $\frac{1}{3}$, $\frac{1}{2}$, $\frac{1}{8}$, $\frac{1}{4}$

d) $\frac{1}{2}$, $\frac{1}{10}$, $\frac{1}{3}$, $\frac{1}{5}$

f) $\frac{3}{8}$, $\frac{1}{5}$, $\frac{2}{4}$, $\frac{9}{10}$

e) $\frac{1}{8}$, $\frac{1}{5}$, $\frac{1}{2}$, $\frac{1}{10}$

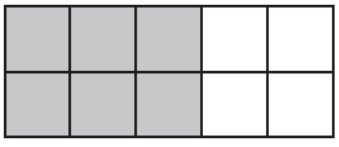
f) $\frac{3}{8}$, $\frac{1}{5}$, $\frac{2}{4}$, $\frac{9}{10}$

h) $\frac{2}{7}$, $\frac{1}{5}$, $\frac{2}{3}$, $\frac{2}{9}$

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.



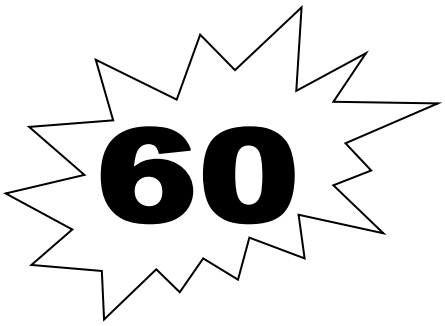
2. Which **two** of these fractions are equivalent to $\frac{1}{4}$?

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

FRACTIONS OF AMOUNTS

Work out all these fractions of 60

1/2	**1/3**	**1/4**	**2/4**	**1/6**
1/12	**3/12**		**6/12**	**2/6**
2/12	**4/12**		**4/10**	**3/6**
1/10	**2/10**	**5/10**	**1/5**	**2/5**



EXAM QUESTIONS

1. 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.

2. Find $\frac{7}{10}$ of £50

3. $\frac{3}{4}$ of 200

4. 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?

5. 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.

+	$\frac{1}{3}$	$\frac{2}{5}$	$\frac{3}{8}$	$\frac{2}{7}$
$\frac{1}{2}$				
$\frac{2}{3}$				

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.

×	$\frac{1}{3}$	$\frac{2}{5}$	$\frac{3}{8}$	$\frac{2}{7}$
$\frac{1}{2}$				
$\frac{2}{3}$				

MIXED NUMBERS

1. $1\frac{1}{2}+2\frac{3}{5}$ 2. $3\frac{2}{5}-1\frac{1}{2}$ 3. $2\frac{2}{3}\times3\frac{1}{4}$

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 $\frac{3}{7}\times28$

5. Work out $\frac{3}{5}\div6$

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

SQUARES, CUBES, POWERS AND ROOTS

POWERS AND ROOTS 'COLLECT A LETTER'

START	1000	8	32	49	64
P	O	U	E	T	A
2^3	9^2	5^2	7^3	6^3	2^4

27	121	36	100	1	125
E	D	L	N	H	I
4^3	2^5	5^3	10^3	6^2	0^2

216	16	343	0	25	81
I	C	R	S	T	R
10^2	1^5	END	7^2	3^3	11^2

1) √25 3^2 √36 2^3 √100

2) √100 4^2 2^2 √81 √121

3) 5^2 $4^2 + 2^2$ √144 √25+√36 $1^3 + 3^3$

4) √36 - √4 $4^2 - 2^2$ $1^3 + 2^3$ √100 - 3^2 $1^3 + 1^2$

EXAM QUESTIONS

1. Write down the values of

   (a) 4^2

   (b) $\sqrt{81}$

2. Work out the value of 10^5

3. (a) Work out 3.7^2

   (b) Work out the cube of 4

   (c) Work out $3 \div 0.7^2$

   (i) Write down the full calculator display.

   (ii) Give your answer to the nearest whole number.

4. (a) Calculate $2.7^2 + \sqrt{3.5}$

   (b) Calculate the cube of 4.2

INDEX LAWS

1. Write each of these as simply as possible using indices.

a) 2x2x2x2x2 b) y x y x y x y c) 9x9x9 d) 8x8x8x8x8x8x8

2. Write down the value of the missing index.

a) $2^2 \times 2^3 = 2^x$ b) $3^8 \times 3^x = 2^{12}$ c) $5^2 \times 5^x = 5^9$ d) $2^x \times 2^3 = 2^7$

e) $(2^2)^4 = 2^x$ f) $(2^6)^x = 2^{18}$ g) $\frac{3^9}{3^2} = 3^x$ h) $\frac{4^8}{4^x} = 4^5$

3. State whether each equation is TRUE or FALSE.

a) $7^2 \times 7^6 = 7^8$ b) $\frac{8^3}{8} = 8^2$ c) $(5^4)^2 = 5^6$

EXAM QUESTIONS

1. Simplify

(a) $c \times c \times c \times c$

(b) $d^3 \times d^2$

2. Simplify

(a) $w^6 \times w^2$

(b) $x^3 \div x^5$

3. Simplify

(b) $d^3 \times d^2$

4. Simplify

$x^5 \times x^{-2}$

POWERS OF 10 AND STANDARD INDEX FORM

MULTIPLYING AND DIVIDING BY POWERS OF 10

1	891.8	×	10	**21**	73.66	÷	10
2	59.15	×	100	**22**	70.07	÷	10
3	63.51	×	100	**23**	47.5	÷	100
4	3.107	×	100	**24**	261.6	÷	10
5	0.7303	×	10	**25**	0.1987	÷	10
6	0.7146	×	1000	**26**	1.914	÷	10
7	5.638	×	1000	**27**	0.8249	÷	10
8	539.7	×	100	**28**	552.5	÷	100
9	757.8	×	100	**29**	105.6	÷	10
10	2.023	×	100	**30**	695	÷	100
11	970.9	×	0.1	**31**	756	÷	10
12	942.3	×	0.1	**32**	54.6	÷	100
13	181.8	×	0.01	**33**	398	÷	10
14	0.7792	×	0.1	**34**	9364	÷	1000
15	0.7353	×	0.01	**35**	391	÷	10
16	558.6	×	0.1	**36**	34010	÷	1000
17	51.95	×	0.01	**37**	627100	÷	1000
18	0.9222	×	0.1	**38**	626000	÷	1000
19	359.6	×	0.1	**39**	77400	÷	1000
20	849.7	×	0.1	**40**	86.19	÷	1000

EXAM QUESTIONS

1. $0.3 \times 100 + 2.4 \times 10$

2. Magazines are stored in piles of 100.
   Each magazine is 0.4 cm thick.
   Calculate the height of one pile of magazines.

3. Jane says,

   "To multiply a number by 10, put a zero on the end."

   She uses her rule to write these examples.

   A $53 \times 10 = 530$

   B $0.53 \times 10 = 0.530$

   C $530 \times 10 = 5300$

   D $5.3 \times 10 = 5.30$

   (a) State which of Jane's examples are incorrect.

   (b) Choose one of Jane's incorrect examples.

   Write the example in the box below with the correct answer.

   ..... × 10 = ...