Name: Maths Group: Tutor Set:

Homework Booklet
KS3 Levels 3-8

Unit 13 – Fractions, Decimals and Percentages

Remember to use the back of a page if you need more working out space.

Complete this table indicating the homework you have been set and when it is due by.

Date	Homework	Due By	Handed In

Please take care of the booklet as you will be required to make a donation to replace it if lost or damaged beyond use.

U13 – Fractions, Decimals and Percentages
FDP Equivalence
No Calculator Allowed

Section A

Copy and complete the table.

Fractions	Decimals	Percentages
$\frac{1}{10}$		10%
	0.25	
$\frac{1}{3}$		33.3̇ %
$\frac{1}{2}$		
$\frac{1}{100}$		
	0.75	75%

Section B

Use the fractions you know to convert these fractions to decimals.

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

5) $\frac{2}{4} =$ 6) $\frac{3}{4} =$ 7) $\frac{4}{4} =$ 8) $\frac{2}{3} =$

9) $\frac{3}{3} =$ 10) $\frac{2}{10} =$ 11) $\frac{5}{10} =$ 12) $\frac{8}{10} =$

13) $\frac{10}{10} =$ 14) $\frac{2}{100} =$ 15) $\frac{5}{100} =$ 16) $\frac{50}{100} =$

Section C

Convert these decimals to percentages.

a) 0.9   =   b) 1.7 =   c) 0.5   =   d) 2.4=   e) 0.2=

f) 3.75 =   g) 0.35 =   h) 1.25 =   i) 0.55 =   j) 0.95 =

k) 2.44 =   l) 6.32 =   m) 0.88 =   n) 4.92=   o) 2.04=

Section D

Convert these percentages to decimals

1)   25% =   2) 10% =

2)   3) 19% =   4) 40% =

U13 – Fractions, Decimals and Percentages
Fractions in Picture Form
No Calculator Allowed

Section A

Shade in the amount stated.

$= \dfrac{2}{8}$ $= \dfrac{1}{2}$ $= \dfrac{1}{4}$

$= \dfrac{3}{12}$ $= \dfrac{1}{2}$ $= \dfrac{1}{3}$

Section B

What fraction of each shape is shaded?

1)   2)   3)

1)

2)

3)

Section C - Investigation

1) Draw the grid and split it in half using the grid lines. Then keep drawing the grid splitting it in half using as many different ways as possible, colouring them each time.

2) Draw the grid and split it into thirds using the grid lines. Then keep drawing the grid splitting it into thirds using as many different ways as possible, colouring them each time.

U13 – Fractions, Decimals and Percentages
Fractions – Simplifying and Ordering
No Calculator Allowed

Section A - Equivelent fractions

1). $\dfrac{2}{3} = \dfrac{}{12}$

2). $\dfrac{4}{5} = \dfrac{}{30}$

3). $\dfrac{1}{3} = \dfrac{}{18}$

4). $\dfrac{2}{5} = \dfrac{}{45}$

5). $\dfrac{3}{7} = \dfrac{}{35}$

6). $\dfrac{4}{7} = \dfrac{}{21}$

7). $\dfrac{3}{5} = \dfrac{}{50}$

8). $\dfrac{5}{6} = \dfrac{}{24}$

9). $\dfrac{5}{6} = \dfrac{}{42}$

10). $\dfrac{9}{12} = \dfrac{}{48}$

Section B - Simplifying fractions

1). $\dfrac{5}{10}$

2). $\dfrac{10}{30}$

3). $\dfrac{6}{18}$

4). $\dfrac{8}{10}$

5). $\dfrac{15}{20}$

6). $\dfrac{10}{40}$

7). $\dfrac{8}{24}$

8). $\dfrac{12}{24}$

Section C - Simplifying fractions

By cancelling down, write the following fractions in their simplest form.

1) 6/24 =

2) 4/6 =

3) 66/80=

4) 30/35=

5) 22/55 =

6) 12/100 =

7) 82/102=

8) 57/90=

Section D – Write as mixed numbers

1). $^{11}/_2$

2). $^7/_3$

3). $^7/_4$

4). $^{13}/_2$

Write as improper fractions

1). $1\,^3/_4$

2). $2\,^1/_3$

3). $1\,^4/_5$

4). $3\,^1/_2$

Section D – Ordering

Adam was trying to do his maths homework which asked him to order fractions from smallest to largest. He was confused about which one was bigger; ¾ or 2/3?
His friend told him to use equivalent fractions and showed him that ¾ = 9/12 and 2/3 = 8/12 so ¾ is bigger. Use this technique to order the fractions below.

Write these fractions in order of size (smallest first)

a) $\dfrac{3}{8}$ $\dfrac{9}{16}$ $\dfrac{1}{4}$ $\dfrac{5}{16}$

c) $\dfrac{5}{8}$ $\dfrac{4}{6}$ $\dfrac{3}{24}$ $\dfrac{7}{12}$

b) $\dfrac{2}{3}$ $\dfrac{7}{12}$ $\dfrac{3}{4}$ $\dfrac{5}{6}$

d) $\dfrac{6}{10}$ $\dfrac{4}{5}$ $\dfrac{5}{12}$ $\dfrac{16}{30}$

Section E – Which is bigger?

Which of these two fractions is the bigger?

$$\frac{3}{4} \quad \text{or} \quad \frac{2}{3}$$

Give a reason for your answer.

Section F - Recurring decimals

Kim's teacher told her that in general to turn a fraction into a decimal you can do a long division where you divide the top number by the bottom number.
For example ¾ = 3 ÷ 4 = 0.75

However she also found out that not all decimals end, some go on for ever and are called *recurring decimals*.

By using long division, change these fractions into decimals, but stop after you get 6 decimals places. What do you notice?

1) 3/7   2) 7/11   3) 5/6

U13 – Fractions, Decimals and Percentages
Fractions of Quantities
No Calculator Allowed

Section A – Fractions of quantities.

1)	$\frac{1}{2}$	of	16			6)	$\frac{1}{3}$	of	29
2)	$\frac{1}{4}$	of	20			7)	$\frac{3}{4}$	of	16
3)	$\frac{1}{4}$	of	36			8)	$\frac{3}{5}$	of	30
4)	$\frac{1}{8}$	of	48			9)	$\frac{2}{7}$	of	14
5)	$\frac{1}{10}$	of	40			10)	$\frac{2}{3}$	of	12

Section B – Find the following fractions of amounts;

1). $\frac{1}{4}$ of 8   2). $\frac{1}{3}$ of 12   3). $\frac{1}{2}$ of 10   4). $\frac{1}{5}$ of 10   5). $\frac{1}{4}$ of 16

6). $\frac{1}{3}$ of 6   7). $\frac{1}{4}$ of 20   8). $\frac{1}{5}$ of 20   9). $\frac{1}{7}$ of 14   10). $\frac{1}{6}$ of 18

Section C – More fractions of quantities.

1). $\frac{2}{3}$ of 18   2). $\frac{2}{5}$ of 10   3). $\frac{3}{4}$ of 12   4). $\frac{2}{7}$ of 14   5). $\frac{3}{5}$ of 20

6). $\frac{4}{5}$ of 35   7). $\frac{2}{3}$ of 24   8). $\frac{3}{4}$ of 32   9). $\frac{2}{3}$ of 36   10). $\frac{2}{5}$ of 45

11). $\frac{3}{4}$ of 36   12). $\frac{4}{5}$ of 55   13). $\frac{2}{3}$ of 39   14). $\frac{3}{5}$ of 35   15). $\frac{3}{4}$ of 44

16). $\frac{5}{6}$ of 12   17). $\frac{3}{5}$ of 50   18). $\frac{4}{7}$ of 14   19). $\frac{3}{7}$ of 21   20). $\frac{4}{9}$ of 18

Section D – fill in the blanks.

1). $\left(\frac{1}{4}\right)$ — X — (48) — = — ☐

2). $\left(\frac{1}{3}\right)$ — X — (51) — = — ☐

3). $\left(\frac{1}{5}\right)$ — X — (65) — = — ☐

4). $\left(\frac{1}{3}\right)$ — X — $(\bigcirc)$ — = — 4

5). $\left(\frac{1}{2}\right)$ — X — $(\bigcirc)$ — = — 18

6). $\left(\frac{1}{5}\right)$ — X — $(\bigcirc)$ — = — 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.

U13 – Fractions, Decimals and Percentages
Fractions - 4 Operations
No Calculator Allowed

Write down the answers to these questions;

1) $\frac{4}{13} + \frac{7}{13} = \underline{\quad}$

2) $\frac{1}{8} + \underline{\quad} = \frac{7}{8}$

3) $\underline{\quad} + \frac{5}{14} = \frac{13}{14}$

4) $\underline{\quad} + \frac{2}{13} = \frac{11}{13}$

5) $\frac{6}{7} - \frac{2}{7} = \underline{\quad}$

6) $\frac{12}{13} - \frac{5}{13} = \underline{\quad}$

7) $\frac{7}{15} + \frac{5}{15} = \underline{\quad}$

8) $\frac{9}{10} - \underline{\quad} = \frac{1}{10}$

9) $\frac{7}{18} + \underline{\quad} = \frac{15}{18}$

10) $\frac{19}{20} - \frac{13}{20} = \underline{\quad}$

11) $\underline{\quad} + \frac{6}{15} = \frac{14}{15}$

12) $\underline{\quad} - \frac{3}{7} = \frac{1}{7}$

Write down the answers to these questions;

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

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

3). $\frac{3}{4} - \frac{5}{8}$

4). $\frac{4}{9} + \frac{1}{3}$

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

6). $\frac{1}{4} + \frac{5}{12}$

7). $\frac{8}{9} - \frac{2}{3}$

8). $\frac{7}{8} - \frac{1}{2}$

9). $\frac{3}{4} - \frac{2}{3}$

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

11). $\frac{4}{5} - \frac{1}{2}$

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

13). $\frac{3}{4} + \frac{1}{6}$

14). $\frac{1}{4} + \frac{3}{5}$

15). $\frac{5}{7} - \frac{2}{3}$

16). $\frac{3}{8} + \frac{1}{6}$

Write down the answers to these questions;

1). $3 \div \dfrac{1}{2}$ 2). $2 \div \dfrac{1}{5}$ 3). $4 \div \dfrac{1}{3}$ 4). $2 \div \dfrac{1}{4}$ 5). $3 \div \dfrac{1}{5}$

6). $4 \div \dfrac{1}{6}$ 7). $3 \div \dfrac{1}{8}$ 8). $4 \div \dfrac{1}{2}$ 9). $5 \div \dfrac{1}{3}$ 10). $4 \div \dfrac{1}{10}$

Write down the answer to these questions;

1). $\dfrac{2}{3} \div \dfrac{5}{7}$ 2). $\dfrac{3}{4} \div \dfrac{2}{5}$ 3). $\dfrac{4}{5} \div \dfrac{1}{3}$ 4). $\dfrac{2}{7} \div \dfrac{3}{8}$ 5). $\dfrac{5}{6} \div \dfrac{1}{2}$

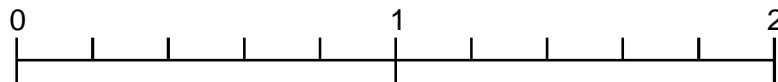Mixed Questions: Evaluate the following (Write each fraction in its simplest form)

a) $\dfrac{3}{4} + \dfrac{1}{8} =$ b) $\dfrac{2}{5} + \dfrac{2}{4} =$ c) $\dfrac{4}{8} \div \dfrac{2}{5} =$ d) $\dfrac{12}{15} \times \dfrac{3}{4} =$

e) $\dfrac{5}{6} \times \dfrac{3}{7} =$ f) $\dfrac{1}{8} \times \dfrac{10}{11} =$ g) $\dfrac{21}{25} \div \dfrac{4}{6} =$ h) $\dfrac{8}{21} - \dfrac{3}{7} =$

Try this for a challenge!

(a)   Add $\dfrac{6}{10}$ and $\dfrac{6}{5}$

Now use an arrow (↓) to show the result on the number line.

0   1   2

(b)   How many **sixths** are there in $3\dfrac{1}{3}$?

(c)   Work out $3\dfrac{1}{3} \div \dfrac{5}{6}$.

Try this for a challenge!

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 $\dfrac{1}{2} + \dfrac{1}{3}$

U13 – Fractions, Decimals and Percentages
Percentages of Amounts
No Calculator Allowed

Find the percentages of these amounts;

1) 50% of 20 =   4) 10% of 90 =   7) 50% of 70=

2) 50% of 52 =   5) 50% of 112 =   8) 10% of 340=

3) 10% of 20 =   6) 10 of 110 =   9) 60% of 20=

Write down the answers to these questions;

1) 5% of 50 =   4) 25% of 60=   7) 85% of 110=

2) 55% of 120=   5) 90% of 40=   8) 35% of 80=

3) 75% of 80=   6) 20% of 50=   9) 2.5% of 80=

Increase these amounts by the following percentages;

1) 20 by 50%   4) 90 by 10%   7) 70 by 50%

2) 52 by 50%   5) 112 by 50%   8) 340 by 10%

3) 20 by 10%   6) 110 by 10%   9) 20 by 60%

Decrease these amounts by the following percentages;

1) 50 by 5%   3) 60 by 25%   5) 40 by 90%

2) 120 by 55%   4) 80 by 75%   6) 50 by 20%

U13 – Fractions, Decimals and Percentages
Percentage Increase/Decrease
Calculator Allowed

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1. Percentage Increase And Decrease

    a) Increase £90 by 10%

    b) Increase £110 by 50%

    c) Increase £120 by 5%

    d) Decrease £40 by 20%

    e) Decrease £700 by 30%

    f) Decrease £320 by 5%

    g) Increase £620 by 25%

    h) Decrease £180 by 60%

Increase these amounts by the following percentages;

    1) 50 by 5%   =   4) 60 by 25% =

    2) 120 by 55% =   5) 40 by 90% =

    3) 80 by 75% =   6) 50 by 20% =

Decrease these amounts by the following percentages;

    1) 50 by 19%   =   4) 60 by 34%   =

    2) 120 by 43% =   5) 40 by 99%   =

    3) 80 by 71%   =   6) 50 by 69%   =

Problem Solving

(a) Alice sees two advertisements for the same MP3 player.

CutPrices	The Audio Store
£80	£92
Price does **not** include VAT	Price includes VAT

The rate of VAT is $17\frac{1}{2}\%$.

Alice works out that the MP3 player costs more at CutPrices than at The Audio Store.

How much more does it cost at CutPrices?

A businessman was looking at the performance of companies share prices around the world to see which one he wanted to invest in. Below are the share prices of 4 companies with the estimated percentage increase or decrease for the following day. The businessman will invest in the company with the cheapest share price. Which company does he invest in?

Company 1 – 112.3p +1.8%   Company 2 – 120.1p   -3.2%
Company 3 – 115.5p -0.5%   Company 4 – 109.7p   +4.5%

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?

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?

Mr and Mrs Smith are buying a washing machine in a sale.

SALE
15% OFF
Washing Machine
Was £ ?
Now £323

What was the original price of the washing machine?