

Number W/C 27th April 2020

Multiplying and Dividing by decimals

and

Terminating and Recurring decimals

Hopefully you have finished all of the work on Vectors and were able to practice your method for both multiplication and division, last week. If this is not the case, I recommend that you practice these skills before moving on.

Warning – this work looks longer than it is because I have included lots of information for you....the last task is a mymaths homework task due on 1st May – don't give up before you get to this!!! Have fun.

Understanding the impact of using numbers between 0 and 1:

It may seem obvious to some but be aware that **when you multiply by a number greater than 1, the answer is greater than the original number. But when you multiply by a number between 0 and 1, the answer is smaller than the original number.**

e.g $10 \times \frac{1}{2}$ means 10 lots of $\frac{1}{2}$ which equals 5

and $12 \times \frac{1}{3}$ means 12 lots of $\frac{1}{3}$ which equals 4

In general:

$$m \times \frac{1}{n} = m \div n$$

When you divide by a number greater than 1, the answer is smaller than the original number. But when you divide by a number between 0 and 1, the answer is greater than the original number

$$10 \div 2 = 5 \quad \text{but} \quad 10 \div \frac{1}{2} = 20$$

$$\text{Similarly} \quad 10 \div \frac{1}{3} = 30 \quad \text{and} \quad 10 \div \frac{1}{4} = 40$$

In general:

$$m \div \frac{1}{n} = mn$$

Terminating and Recurring decimals:

You need to be able to use your skill with division to convert simple fractions to decimals by division.

$$\frac{3}{8} = 3 \div 8 \quad \text{Use the bus stop method to work this out (if calculators are not allowed)}$$

$$0.375 \quad \text{This is difficult to show in word!}$$
$$8 \overline{) 3.000}$$

A **rational number** is a number that can be written as a fraction, for example, $\frac{1}{4}$ or $\frac{10}{3}$.

When a fraction is converted to a decimal it will be either:

→ **A terminating decimal**

→ **A recurring decimal**

A terminating decimal has a finite number of digits.

For example: $\frac{1}{4} = 0.25$ and $\frac{1}{8} = 0.125$.

A recurring decimal has a digit, or block of digits, that repeat infinitely.

Recurring digits can be shown by putting a dot over the first and last digit of the group that repeats.

A fraction that does not convert to a terminating decimal will give a recurring decimal. You may already know that $\frac{1}{3} = 0.3333\dots$ This means that the 3s go on for ever and the decimal never ends.

To convert the fraction, you can usually use a calculator to divide the numerator by the denominator.

Note that calculators round off the last digit so it may not always be a true recurring decimal in the display.

So, this was a reminder of some principles – now it is time to do some examples.

Task 1:

Watch the mathswatch video clips 66 and 67.

If you are using the Chinese method (Napier's bones) for multiplication then you can leave in the decimal point and proceed as I have shown you before in class. It would still be helpful to work through the examples in the clip, using your own method and make sure you do all of the interactive questions afterwards.

Task 2: Complete the questions below. Write out the **questions and answers** in your book and please **DO NOT USE** a calculator.

A. All the following multiplications have been done for you, except for one vital part - the answer has no decimal point!

For each answer, clearly place the decimal point in the correct position.

1.) $2.4 \times 1.26 = 3024$

2.) $5.7 \times 2.3 = 1311$

3.) $0.3 \times 0.3 = 009$

4.) $4.2 \times 1.37 = 5754$

5.) $0.2 \times 0.3 = 006$

6.) $0.5 \times 0.03 = 0015$

7.) $8 \times 7.2 = 576$

8.) $9.73 \times 1.24 = 120652$

B. Multiplying Decimals - Using the first statement decide where the decimal point should go to answer the next set of questions.

1.) $26 \times 32 = \mathbf{832}$

2.) $134 \times 52 = \mathbf{6968}$

$2.6 \times 32 =$

$13.4 \times 52 =$

$2.6 \times 3.2 =$

$1.34 \times 5.2 =$

$0.26 \times 0.32 =$

$0.134 \times 52 =$

3.) $63 \times 71 = 4473$

$6.3 \times 71 =$

$0.63 \times 71 =$

$63 \times 7.1 =$

$63 \times 0.71 =$

$7.1 \times 0.063 =$

4.) $36 \times 571 = 20556$

$3.6 \times 5.71 =$

$0.36 \times 57.1 =$

$0.036 \times 5.71 =$

$36 \times 57.1 =$

$5.71 \times 0.36 =$

C: The MULTIPLYING effect: (Numbers between 0 and 1)

1.) $4 \times 0.5 =$ _____ (same as $\frac{1}{2}$ of 4 or $4 \div 2$)

2.) $16 \times 0.5 =$ _____

3.) $8 \times 0.3 =$ _____

4.) $40 \times 0.2 =$ _____

5.) $8 \times 0.1 =$ _____

6.) $9 \times 0.4 =$ _____

7.) $7 \times 0.6 =$ _____

8.) $16 \times 0.25 =$ _____

9.) $8 \times 0.75 =$ _____

10.) $200 \times 0.2 =$ _____

11.) $7 \times 0.8 =$ _____

12.) $20 \times 0.75 =$ _____

D: The DIVIDING effect: (HINT: For these questions it is sometimes easier to convert the decimal to a fraction and then X by the reciprocal)

e.g. $7 \div 0.1 = 7 \div \frac{1}{10} = 7 \times 10 = 70$

1.) $4 \div 0.5 =$ _____ (Hint: 4×2)

2.) $12 \div 0.5 =$ _____

3.) $8 \div 0.1 =$ _____

4.) $40 \div 0.2 =$ _____

5.) $6 \div 0.5 =$ _____

6.) $16 \div 0.4 =$ _____

7.) $9 \div 0.3 =$ _____

8.) $12 \div 0.6 =$ _____

9.) $6 \div 0.2 =$ _____

10.) $1 \div 0.25 =$ _____

11.) $6 \div 0.25 =$ _____

12.) $6 \div 0.3 =$ _____

Task 3: (Multiplying and dividing with decimals)

There is further practice on pages 12 – 15 of your on-line book. Just choose a few from each exercise. Show your workings clearly in your exercise book and then mark them.

Task 4: (Recurring Decimals)

Using your online book complete a selection of questions from Page 58 Exercise 2 and Page 59 Exercise 3 (see example 5 at the top of the page) and Page 60 Exercise 5!

Task 5:

There is a mymaths homework on recurring decimals that is due for this **FRIDAY 1st May**.

I will send the answers to the questions on this sheet next week and then you will be in a position to RAG rate how you feel about this important skill.