

21/3 Dividing Decimals by a whole number.

Examples

$$\begin{array}{r} 1) \quad 0.6 \div 2 \\ \quad 0.3 \\ \hline 2) 0.6 \end{array}$$

answer = 0.3

$$\begin{array}{r} 2) 0.48 \div 3 \\ \quad 0.16 \\ \hline 3) 0.48 \end{array}$$

answer = 0.16

Dividing by a Decimal
multiply so we divide
by a whole number

Examples

$$1) 9 \div 0.3$$

$$= 90 \div 3$$

$$3) 90$$

answer = 30

multiply both
9 & 0.3 by 10

Rounding

A) Rounding to nearest
1000, 100 or 10

use zeroes as place
holders 5 or more
round up.

Examples

- 1) 51360 to nearest 1000 =
- 2) 7621 to nearest 100 = 7600
- 3) 8219 to nearest 10 = 8220

Rounding to 1, 2 or 3
decimal places

Draw a line after digit in
needed place 5 or more
round up

Examples

- 1) 58.315 to 1dp = 58.4
- 2) 79.47 to 2dp = 79.47
- 3) 8.9765 to 3dp = 8.977

22/3 Integers

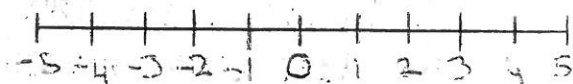
There are positive and negative whole numbers.

eg. ... -3, -2, -1, 0, 1, 2, 3

Addition

if necessary use a number line.

eg. $-3 + 2 + -4 = -5$



Less than < greater than

Less than symbol <

Greater than symbol >

eg. $-6 < -2$
less than.

eg. $+4 > -1$
greater than.

Also

\leq less than or equal to

\geq greater than or equal.

Subtraction

What is $5 - 4$?

Here we use the negative (subtraction) of a negative, is positive

$$\text{ie } 5 - 4 = 5 + 4 = 9$$

Multiplication & Division of integers.

consider the following table

X	3	2	1	0	-1	-2	-3
3	9	6	3	0	-3	-6	-9
2	6	4	2	0	-2	-4	-6
1	3	2	1	0	-1	-2	-3
0	0	0	0	0	0	0	0
-1	-3	-2	-1	0	1	2	3
-2	-6	-4	-2	0	2	4	6
-3	-9	-6	-3	0	3	6	9

Summary

∞

$$+ \times + = +$$

$$+ \times - = -$$

$$- \times + = -$$

$$- \times - = +$$

ie when the signs are the same the answers positive

Factors

We know the factors of 6 are 1, 2, 3, 6 i.e. all the numbers that go into 6 without remainder we can list the pairs that multiply to give 6 to find its factor i.e. 1×6 , 2×3 so factors are 1, 2, 3, 6

Highest common Factor

$$\begin{array}{cc|cc|cc} \text{eg.} & 14 & 1 & 2 & 7 & 14 \\ & 35 & 1 & 5 & 7 & 35 \end{array}$$

HCF of 14 and 35 is 7

Multiples

Multiples of a number are that number to it continually

eg multiples of 6 are 6, 12, 18, 24, 30 ect

Lowest common multipl

eg

$$5: 10, 15, \textcircled{20}, 25, 30$$

$$4: 8, 12, 16, \textcircled{20}, 24$$

LCM of 5 and 4 is 20

Prime numbers

Prime numbers have only 2 factors, 1 and them selve the first prime number is 2 (the only even prime.)

Examples

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, ...

Order of Operation

Since $4 + 3 \times 6$ could have two answers i.e. 4 or 22 we use bedmas to know what to do first, Where,

BEDMAS
Brackets
exponents
Division
Multiplication
Add
Subtract

Examples

$$1 \quad 4 + 3 \times 6 = 4 + 18 \\ = 22$$

$$2 \quad 15 + (8 - 4) \times 3 = 15 + 12 \\ = 27$$

$$3 \quad 4 \times 3 - 2 \times 5 = 12 - 10 \\ = 2.$$

26/4 Recurring Decimals

If a digit keeps repeating we use a dot to show this.

$$\text{eg } 1) 0.3333\ldots = 0.\dot{3}$$

$$2) 0.9999\ldots = 0.\dot{9}$$

$$3) 0.1777\ldots = 0.1\dot{7}$$

$$4) 0.2525\ldots = 0.\dot{2}\dot{5}$$

Squares and powers

When a number is squared, it is multiplied by itself

$$\text{e.g. } 1) 5^2 = 5 \times 5 = 25$$

$$2) 2.1^2 = 2.1 \times 2.1 = 4.41$$

2.1 \times^2 = on calculator

Fractions

Understanding Fractions

We would need five $\frac{1}{5}$'s to make one whole, but only three $\frac{1}{5}$'s so $\frac{3}{5}$ is smaller than $\frac{1}{2}$

Mixed Numbers & Improper Fractions

A mixed number has a number part and a fraction part eg $2\frac{1}{3}$

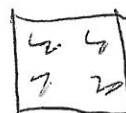
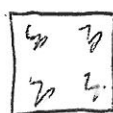
An improper fraction has a numerator (top part) bigger than the denominator (bottom part)

eg $\frac{7}{5}$ - Numerator
5 - denominator

Converting Between mixed Numbers & Improper Fractions

A) Mixed number to improper fraction

$$\text{eg } 2\frac{1}{4} = \frac{4 \times 2 + 1}{4} = \frac{9}{4}$$



2 wholes = $\frac{8}{4}$ plus $\frac{1}{4} = \frac{9}{4}$

eg $4\frac{2}{3} = 3 \times 4 + 2 = \frac{14}{3}$

B) Improper fractions to Mixed numbers

~~Equal (Equal)~~

Equal Fractions

$\frac{1}{2} = \frac{5}{10}$ same value but bigger number.

For $\frac{1}{2}$ to $\frac{5}{10}$, $\frac{1}{2} \times \frac{5}{5} = \frac{5}{10}$

Since $\frac{5}{5} = 1$ so only multiply by 1.

ie $5 \div 5 = 1$

Also $\frac{5}{10} = \frac{5 \div 5}{10 \div 5} = \frac{1}{2}$

10/5

Fraction of a quantity

eg find $\frac{7}{2}$ of 36

'of' means multiply on calculator

$1 \times 36 \div 2 = 18$

eg find $\frac{3}{5}$ of 65
 $3 \times 65 \div 5 = 39$

eg find $\frac{1}{3}$ of 36
 $1 \times 36 \div 3 = 12$

or $36 \div 3 \times 1 = 12$

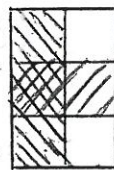
eg find $\frac{2}{3}$ of 36

Since $\frac{1}{3}$ is 12, $\frac{2}{3} = 24$

Fraction of a fraction

eg $\frac{1}{2} \times \frac{1}{3}$

We can use a diagram



$\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$

algebraically / algorithm

$\frac{1}{2} \times \frac{1}{3} = \frac{1 \times 1}{2 \times 3} = \frac{1}{6}$

eg $\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$

14/5

Phuffs

Phuffs

Dividing Fractions

We multiply by the reciprocal. The reciprocal of 2 is $\frac{1}{2}$
 The reciprocal of $\frac{4}{5}$ is $\frac{5}{4}$

Example

1) $3 \div \frac{1}{2} = 3 \times \frac{1}{2} = 6$
 (3 pizzas divided into halves, get 6 pieces)

2) $\frac{1}{2} \div \left(\frac{2}{3}\right) = \frac{1}{2} \times \frac{3}{2} = \frac{3}{4}$
 multiply by reciprocal

Percentages

Percent means part of 100
 or per 100
 ie $20\% = \frac{20}{100} = 0.20$

Percentage converts to fractions (or decimals) by writing over 100

eg $17\% = \frac{17}{100} = 0.17$

$125\% = \frac{125}{100} = 1.25$

to convert fractions and decimals to percentage we can multiply by 100.

eg $\frac{2}{5} \times 100 = 40\%$ and
 $\frac{2}{5} = \frac{40}{100} = 40\%$.

Writing a Quantity as a percentage of another

eg If you got 39 marks in a test out of 90 what is that as a percent age

Answer
 43% (rounded)

~~Percentage of another~~

Percentage Increase & Decrease

Example

You find a portable CD player on sale. Its marked price is \$199 but the sale is offering 15% discount. How much do I pay?

Answer

$$0.15 \times 199 = 29.85$$
$$\text{sale price} = 199 - 29.85$$
$$\$169.15$$

Point

Money always rounded to 2nd D.P

Example

A sweatshirt has a cost price of \$124. The shop wants to make 13% profit what is the selling price?

Answer

$$0.13 \times 124 = \$16.12$$
$$\text{selling price} = 124 + 16.12$$

28/5 Finding Percentage change

This can be an increase or a decrease

$$\% \text{ change} = \frac{\text{amount of change}}{\text{original amount}} \times 100$$

Example

you buy a car for \$23,000 and 3 years later sell it for \$18,000 = 44%

31/5 Algebra

In algebra we let letters stand for numbers. The letters are called variables. We ~~use~~ leave out the thing.

Examples

1) $x + 5 \rightarrow$ a number plus 5

2) $5x \rightarrow$ 5 times a number

3) $\frac{x}{10} \rightarrow$ a number divided by 10

4) $-2x \rightarrow$ a number times negative 2