Unit 4:

Fractions, Ratios and Percentages

Fractions

Improper Fractions and Mixed Numbers

1) How many times the denominator goes into the numerator is the whole number

2) The numerator is the remainder

3) The denominator stays the same

Convert $\frac{15}{4}$ into a mixed number

$3\frac{3}{4}$

1) Multiply the denominator by the whole number, then add on the numerator.

2) The denominator stays the same

Convert $4\frac{6}{7}$ into an improper fraction

$4 \times 7 = 28$
$28 + 6 = 34$

$4\frac{6}{7} = \frac{34}{7}$

Adding and Subtracting Fractions

$\frac{5}{4} - \frac{1}{7}$

LCM of 4 and 7 = 28

$\frac{35}{28} - \frac{4}{28} = \frac{31}{28}$

1) Find the LCM of the denominator

2) Cross Multiply each fraction

3) Simplify

Dividing Fractions

1) Keep the first fraction

2) Change the sign to a multiply

3) Find the reciprocal of the second fraction

4) Multiply the numerators

5) Multiply the denominators

6) Simplify if needed

$\frac{2}{3} \div \frac{3}{5} =$

$\frac{2}{3} \div \frac{3}{5} = \frac{2}{3} \times \frac{5}{3} = \frac{10}{9}$

Multiplying Fractions

$\frac{3}{4} \times \frac{7}{9} = \frac{3 \times 7}{4 \times 9} = \frac{21}{36}$

When you multiply fractions multiply The numerators and the denominators together

Ratio

Simplifying Ratios

When simplifying ratios we must find the HCF of each number and divide.

Each number must be an integer.

Simplify the ratio

36 : 144

$\div 36 \quad \div 36$

1 : 4

Sharing into a ratio

Alan and Ben share £48 in the ratio 2 : 1

How much does each person get

Steps:

Add the ratios together

Divide the total amount by the ratio total

Multiply the answer by each ratio

2 + 1 = 3

48 ÷ 3 = 16

16 x 2 = £32
16 x 1 = £16

1 : n

When writing ratios in the form 1 : n or n : 1 you must divide to make one of the numbers one.

Writing ratio in the form 1 : n

÷5 (5 : 8 / 1 : 1.6) ÷5

Ratio: Difference Given

Jo and Bill share money in the ratio 4:7 Bill receives £21 more than Jo. How much money was shared out?

1) Find the difference between the ratios

2) Divide the amount by the difference.

3) Multiply the answer by each original ratio

7 – 4 = 3

21 ÷ 3 = 7

7 x 4 = £28

7 x 7 = £49

28 + 49 = £77

Percentages

Increasing and Decreasing by percentages

To increase by a percentage we use multipliers.

To find the multiplier we divide the percentage by 100 and add it to 1.

Increase 30 by 16%

30 x 1.6 = 34.8

To decrease by a percentage we use multipliers.

To find the multiplier we divide the percentage by 100 and subtract it from 1

Decrease 70 by 19%

70 x 0.81 = 56.1

Percentage Change

Percentage change $= \frac{change}{original\ value} \times 100$

What is the percentage increase from 12 to 18?

$\frac{6}{12} \times 100 = 50\%$

Original Value after Percentage Change

The normal price of a television is reduced by 30% in a sale. The sale price of the television is £350. Work out the normal price of the television.

Method :

÷7 (70% is £350 / 10% is £50 / 100% is £500) ÷7, ×10

Financial Maths: Interest

Depreciation

I buy a car for £20000.

It depreciates at a rate of 4% *per annum*

What will it be worth after 3 years?

Initial amount= £20000
Depreciation rate = 4%
Multiplier is x 0.96
It depreciated for 3 years

$20000 \times 0.96^3 = £17694$

Compound Interest

Initial amount x (1 + the rate of interest)^{years}

$A(1+r)^n$

You save £2000 in a savings account for 4 years.
The interest rate is 0.6% per annum.

Initial amount= 2000
Interest rate = 0.6%
Multiplier is x 1.006
It is in the bank for 4 years

2000×1.006^4
=£2048.43