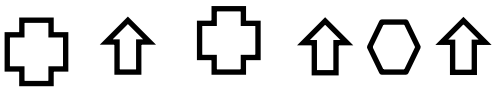
Monifieth High School Maths Department

S1 Topic 12: Ratio and Proportion

1) Write down the ratio between two or more quantities

triangles : rectangles
4 : 3

rectangles : triangles
3 : 4



crosses : arrows : hexagon
2 : 3 : 1

hexagon : crosses : arrows
1 : 2 : 3

2) Simplify ratios

21:28
= 3:4

(dividing both sides by 7)

96:24
= 48:12
= 24:6
= 4:1
(dividing both sides by 2, 2 then 6)

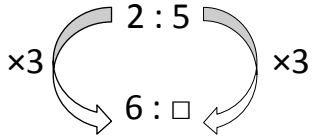
105:140
= 21:28
= 3:4

(dividing both sides by 5 then 7)

3) Use ratios to solve problems

The ratio of blue to silver cars in a car park is 2:5. If there are 6 blue cars how many silver cars are in the car park?

blue : silver

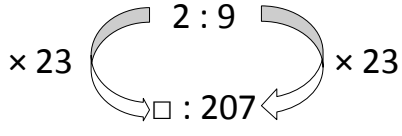


Multiplied 2 by 3 to get 6
so multiply 5 by 3 as well

5 × 3 = 15 cars are silver

The ratio of pupils absent to present in a school is 2:9. If 207 pupils are present how many are absent?

absent : present



207 ÷ 9 = 23 so right hand side has been multiplied by 23

Multiply the left hand side by 23.

2 × 23 = 46 so 46 pupils are absent.

4) Share amounts in a given ratio

Share £84 in the ratio 3:4

3 + 4 = 7 shares are required.

84 ÷ 7 = 12

3 shares = 3 × 12 = £36

4 shares = 4 × 12 = £48

(Check: 36 + 48 = 84 ☺)

Share £546 in the ratio 1:2:3

1 + 2 + 3 = 6 shares required

546 ÷ 6 = 91

1 share = £91

2 shares = 2 × £91 = £182

3 shares = 3 × £91 = £273

(Check: 91 + 182 + 273 = 546 ☺)

5) Solve problems using direct proportion

Five identical cakes weigh 5675g altogether. How much will nine of these cakes weigh?

Weight of one cake = 5675 ÷ 5 = 1135g

Weight of nine cakes = 1135 × 9 = 10 215g

It costs £31 for four adults to go to the cinema. How much will it cost for eleven adults?

Cost for one adult = 31 ÷ 4 = £7.75

Cost for eleven adults = 11 × 7.75 = £ 85.25

All direct proportion problems assume that we are dealing with identical objects or costs.