

Ratio problems and simple percentages – calculator allowed

- 1) Pink paint is made from red and white in the ratio 1:3. What percentage of pink paint is red?
- 2) In a school, the ratio of boys to girls is 7:3. What percentage of the school are boys?
- 3) In a box of chocolates, Jack likes the nutty ones. The ratio of nutty chocolates to non-nutty chocolates is 3:5. What percentage of chocolates will Jack NOT eat?
- 4) In district A, the ratio of boys to girls is 25:30. In district B, the ratio of boys to girls is 32:20.
 - a) Simplify these ratios.
 - b) There is (approximately) the same number of pupils in both districts. By finding the percentage of boys in each district, find out which district has the most boys?
 - c) You are told there are 11000 pupils in each district. How many boys are there in each district?
- 5) The number of new and old cars sold by Suspicious Simon in 2009 is 25 to 125.
 - a) Write this ratio in its simplest form
 - b) In 2010, Simon sells 5 less new cars and 20% more old cars. Write the new ratio of new to old cars in its simplest form

Extension: sharing amounts into ratios

£50 into the ratio 2:3	£70 into the ratio 2:5	£40 into the ratio 3:5
£100 into the ratio 1:9	£300 into the ratio 3:2	£44 into the ratio 4:7

£40 into the ratio 1:2:5	£20 into the ratio 2:1:1	£90 into the ratio 3:2:1
£72 into the ratio 3:2:1:2	£900 into the ratio 10:7:3	£3 into the ratio 8:1:1

Extra problems

£120 is shared amongst three friends: Simon gets £30. Jack and Jill share the remainder in the ratio 4:5. How much does Jill receive?
Sally, Lillian and Deborah initially share £300 in the ratio 3:2:5. Afterwards, Sally and Lillian give £5 each to Deborah. How much does Deborah end up with?
Economy Paint is mixed in the ratio of 1:7 (Red to White) If 63 cl of White paint is used, how much Red paint is used?

Complete the following table:

cost per litre	Juice	Amount used in ml	Cost of item
£1.40	Orange	200	
£1.20	Apple	300	
£2.00	Pineapple		
			Total=£1

Developing ratio understanding further

Part 1: simplify the following ratios

20:40	13:39	5x:15x	22x:2x
65y:100y	28π:36π	100π:60π	55a:77b
12x ² :6x	$\frac{5}{2}:\frac{12}{2}$	$\frac{28}{3}:\frac{100}{3}$	$\frac{7}{4}:\frac{2}{5}$
$\frac{3}{4}:\frac{1}{2}:\frac{5}{6}$	$\frac{3x}{5}:\frac{2x}{6}$	$\frac{4\pi}{3}:\frac{8\pi}{3}$	$\frac{11}{\pi}:\frac{12}{\pi}$

Part 2: problems involving simplifying ratio

Key formulae you will need to use:

<i>Area of Circle</i> = πr^2	<i>Volume of a sphere</i> = $\frac{4}{3}\pi r^3$
<i>Volume of Cylinder</i> = $\pi r^2 h$	<i>Volume of a pyramid</i> = $\frac{1}{3}(\text{base area}) \times \text{height}$

Simplify the ratio of the following pairs of values into its simplest form

The area of two circles with the radii a) 2 and 8 b) 3 and 6 c) 5 and 10 d) 2 and 6 e) 3 and 7
The volume of two cylinders. One has a height of 6 and a radius of 3, the other a height of 4 and a radius of 9
The volume of two spheres, one with a radius of 3, the other with a radius of 4
The volume of two square based pyramids. One has a base with a side of 5, the other has a base with a side of 10. They both have a height of x.
The area of two circles, one has a radius of 10a. The other has a radius of 5a.
The area of two squares. One has a perimeter of 12x. The other has a perimeter of 24x.
The volume of a cylinder with a radius of 5 and a height of 6 and the volume of a sphere with a radius of 10
The volume of two spheres. One with a radius of 6r. The other with a radius of 10r.

Part 3: write these ratios of the following pairs of numbers given in standard form into their simplest form

3.2×10^4 and 4×10^4	1.6×10^2 and 2×10^3
1.3×10^{-2} and 2×10^{-3}	8×10^{-2} and 4×10^{-3}