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 pain 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 reminder 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

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

Part 2: problems involving simplifying ratio

Key formulae you will need to use:

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

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

$3.2 \times 10^4\ and\ 4 \times 10^4$	$1.6 \times 10^2\ and\ 2 \times 10^3$
$1.3 \times 10^{-2}\ and\ 2 \times 10^{-3}$	$8 \times 10^{-2}\ and\ 4 \times 10^{-3}$