

Ratio – Paint Panic **Answers**

You work in a paint factory. You have three basic colours of paint: red, blue and yellow. You must mix these in specific ratios to get the final colours, which are then shipped to shops. Unfortunately, a freak accident involving a paint mixing machine has covered the entire factory, including the colour recipes, in a thick layer of pink paint.

Now your paint mixing machine is fixed, you need to work out your missing recipes, then calculate the amount of red, blue and yellow paint you need to make your customers orders.

Beware! Your paint mixing machine will explode again if your ratios are not in their simplest form.

Name	Description	Red	Blue	Yellow	R:B:Y
Russet	Reddish brown. Twice as much red as blue, with equal amounts blue and yellow.	2	1	1	2:1:1
Sunset	A bright orange. Equal parts red and yellow.	1	0	1	1:0:1
Rust	A dark orange. Twice as much red as Sunset.	2	0	1	2:0:1
Salamander	A medium orange. Halfway between Rust and Sunset	3	0	2	3:0:2
Yellow	It's just yellow.	0	0	1	0:0:1
Chartreuse	A greeny yellow. Take some yellow and add half as much blue.	0	1	2	0:1:2
Olive	A yellowy green. Take some blue and add half as much yellow.	0	2	1	0:2:1
Khaki	A muddy green. Take two cans of Olive and add one can of Chartreuse.	0	5	4	0:5:4
Aquamarine	A greeny blue – the colour of a tropical lagoon. Take some yellow and add four times as much blue.	0	4	1	0:4:1
Cobalt	A deep blue. Equal amounts red and yellow, five times as much blue as red and yellow combined.	1	10	1	1:10:1
Grape	A grape colour. Add some red, then add half as much yellow (as red) and three times as much blue (as red).	2	6	1	2:6:1
Puce	A horrible purply brown. Halfway between Grape and Russet.	4	7	2	4:7:2
Purple	A purply purple. Half blue, half red.	1	1	0	1:1:0
Imperial Purple	A dark purple. Yellow, twice as much red as yellow, then twice as much blue as red.	2	4	1	2:4:1
Mulberry	A reddish purple. Mix two cans of russet, without the yellow, with half a can of Purple.	9	5	0	9:5:0

1. Luckily it's Friday and you only have one order left to do before the weekend. You need 18 litres of Grape, 15 litres of Chartreuse, 30 litres of Yellow and 52 litres of beautiful Puce. Red, yellow and blue paints come in 2 litre cans. How many cans do you need to fetch from the storeroom?

Grape:

2:6:1 of red : blue : yellow.

$2 + 6 + 1 = 9$ litres

$18 \div 9 = 2$

You need 4 litres red, 12 litres blue and 2 litres yellow.

Chartreuse:

0:1:2 of red : blue : yellow.

$0 + 1 + 2 = 3$ litres

$15 \div 3 = 5$

You need 0 litres red, 5 litres blue and 10 litres yellow.

Yellow:

You need 30 litres of yellow.

Puce:

4:7:2 of red : blue : yellow.

$4 + 7 + 2 = 13$ litres

$52 \div 13 = 4$

You need 16 litres red, 28 litres blue and 8 litres yellow.

In total you need:

$4 + 16 = 20$ litres red.

$20 \div 2 = 10$ cans of red.

$12 + 5 + 28 = 45$ litres blue.

$45 \div 2 = 22.5$, or 23 cans of blue.

$2 + 10 + 30 + 8 = 50$ litres yellow.

$50 \div 2 = 25$ cans of yellow.

2. A last-minute urgent order has come in for as much Imperial Purple as you can make. You have 5 cans of red paint, 6 cans of blue paint and 5 cans of yellow paint. How many litres of Imperial Purple can you make?

Imperial Purple needs red, blue and yellow in the ratio 2:4:1.

One batch of Imperial Purple will be 7 litres ($2 + 4 + 1 = 7$).

You have 10 litres of red paint ($5 \times 2 = 10$). This is enough for 5 batches ($10 \div 2 = 5$).

You have 12 litres of blue paint ($6 \times 2 = 12$). This is enough for 3 batches ($12 \div 4 = 3$).

You have 10 litres of yellow paint ($5 \times 2 = 10$). This is enough for 10 batches ($10 \div 1 = 10$).

You therefore only have enough for 3 batches of Imperial Purple, or 21 litres ($7 \times 3 = 21$).

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