

Dr Oliver Mathematics

Worked Examples

Ratio 4

From: Edexcel GCSE 2022 June Paper 2H (Calculator)

1. The ratio of Marta's hourly pay to Khalid's hourly pay is 6 : 5. (4)

Both Marta and Khalid get an increase of £1.50 in their hourly pay.

The ratio of Marta's hourly pay to Khalid's hourly pay after this increase is 13 : 11.

Work out the hourly pay before the increase for Marta and for Khalid.

Solution

What is their rate pay **now**? Is it

- 26 : 22, using 2 as the multiplier?
- 6.5 : 5.5, using $\frac{1}{2}$ as the multiplier?
- or ...?

Well, we will use

$$13 : 11 = 13x : 11x$$

for some value of x .

Now, before the increase,

$$(13x - 1.5) : (11x - 1.5) = 6 : 5 \Rightarrow \frac{(13x - 1.5)}{(11x - 1.5)} = \frac{6}{5}$$

cross-multiplying:

$$\Rightarrow 5(13x - 1.5) = 6(11x - 1.5)$$

$$\Rightarrow 65x - 7.5 = 66x - 9$$

$$\Rightarrow x = 1.5.$$

So, **before the increase**, Marta's hourly pay is

$$13(1.5) - 1.5 = \underline{\underline{\pounds 18}}$$

and Khalid's hourly pay

$$11(1.5) - 1.5 = \underline{\underline{\pounds 15}}.$$

(Let's check:

$$18 : 15 = 3 \times 6 : 3 \times 5 = 6 : 5,$$

and we are finished.)

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