

Dr Oliver Mathematics

Worked Examples

Ratio 1

From: Edexcel 2019 November Paper 3H (Calculator)

1. A group of people went to a restaurant.
Each person chose one starter and one main course.

(4)

Starter	Main Course
Soup	Lasagne
Prawns	Curry

The number of people who chose soup : the number of people who chose prawns = 2 : 3.

Of those who chose soup,

the number of people who chose lasagne : the number of people who chose curry = 5 : 3.

Of those who chose prawns,

the number of people who chose lasagne : the number of people who chose curry = 1 : 5.

What fraction of the people chose curry?

You must show how you get your answer.

Solution

$$2 + 3 = 5,$$

$$5 + 3 = 8, \text{ and}$$

$$1 + 5 = 6.$$

So consider

$$5 \times 8 \times 6 = 240$$

going for a meal (it is a common multiple of 5, 6, and 8). Now,

$$\text{chose soup} = \frac{2}{5} \times 240 = 96$$

and

$$\text{chose prawns} = \frac{3}{5} \times 240 = 144.$$

Starter	Main Course
Soup: 96	Lasagne:
Prawns: 144	Curry:

For those who chose soup,

$$\text{chose lasagne} = \frac{5}{8} \times 96 = 60$$

and

$$\text{chose curry} = \frac{3}{8} \times 96 = 36.$$

Starter	Main Course
Soup: 96	Lasagne: 60 + ...
Prawns: 144	Curry: 36 + ...

For those who chose prawns,

$$\text{chose lasagne} = \frac{1}{6} \times 144 = 24$$

and

$$\text{chose curry} = \frac{5}{6} \times 114 = 120.$$

Starter	Main Course
Soup: 96	Lasagne: 60 + 24 = 84
Prawns: 144	Curry: 36 + 120 = 156

Hence,

$$\begin{aligned} \text{chose curry} &= \frac{156}{240} \\ &= \frac{12 \times 13}{12 \times 20} \\ &= \frac{\cancel{12} \times 13}{\cancel{12} \times 20} \\ &= \frac{13}{20}. \end{aligned}$$