

Equivalent Ratios

Starter

1. (Review of last lesson)

Calculate the surface area of the prism.

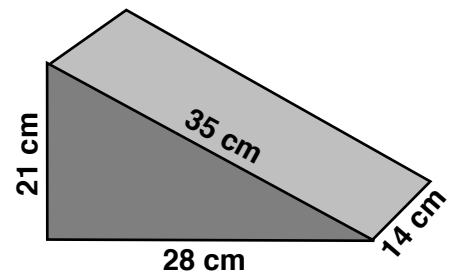
Working: Sloping face = $35 \times 14 = 490$

$$\text{Each triangular face} = \frac{21 \times 28}{2} = 294$$

$$\text{Rectangular base} = 14 \times 28 = 392$$

$$\text{Vertical face} = 21 \times 14 = 294$$

$$\text{Surface area of prism} = 490 + (2 \times 294) + 392 + 294 = 1764 \text{ cm}^2$$



2. Cancel the following fractions: (a) $\frac{6}{8}$ (b) $\frac{16}{56}$

Working: (a) $\frac{3}{4}$ (b) $\frac{2}{7}$

3. Cancel these ratios: (a) $63 : 54$ (b) $2.4 : 40$

Working: (a) Dividing both ratios by 9 gives $7 : 6$

(b) Multiply by 10 to get rid of the decimal $24 : 400$
Then cancel by dividing both ratios by 9 gives $3 : 50$

E.g. Cancel these ratios: (a) $50 \text{ g} : 1.3 \text{ kg}$ (b) $3.2 \text{ mm} : 4 \text{ cm}$

Working: (a) Make sure the units are the same (g) $50 : 1300$
 $1 : 26$

(b) Make sure the units are the same (mm) $3.2 : 40$
Multiply by 10 to get rid of the decimal $32 : 400$
 $2 : 25$

E.g. Express $7 : 29$ in the form $1 : n$.

Working: Divide both ratios by 7: $\frac{7}{7} : \frac{29}{7}$
 $1 : 4.14$ (3 s.f.)

E.g. Cancel these ratios: (a) $\frac{2}{5} : \frac{3}{4}$ (b) $4\frac{2}{3} : 1\frac{1}{2}$

Working: (a) Get a common denominator $\frac{8}{20} : \frac{15}{20}$

Multiply by 20 8 : 15

(b) Form improper fractions	$\frac{14}{3} : \frac{3}{2}$
Get a common denominator	$\frac{28}{6} : \frac{9}{6}$
Multiply by the common denominator	28 : 9

E.g. 1 Write each ratio in its simplest form:

- | | | |
|-----------------|-------------------------|-----------------------------------|
| (a) 12 : 9 : 15 | (b) 0.8 : 1.24 | (c) $2\frac{1}{5} : 3\frac{1}{4}$ |
| (d) 54 cm : 2 m | (e) 25 minutes : 1 hour | |

Working:

(a) Divide each ratio by 3 to get	4 : 3 : 5
(b) Multiply each ratio by 100 to get integers	80 : 124
Divide by 4 to get	20 : 31
(c) Form improper fractions	$\frac{11}{5} : \frac{13}{4}$
Get a common denominator	$\frac{44}{20} : \frac{65}{20}$
Multiply by the common denominator	44 : 65
(d) Make sure the units are the same (cm)	54 : 200
Cancel the ratio by dividing by 2	27 : 100
(e) Make sure the units are the same (min)	25 : 60
Cancel the ratio by dividing by 5	5 : 12

E.g. 2 Express 5 : 12 in the form 1 : n .

Working: Divide both ratios by 5: $\frac{5}{5} : \frac{12}{5}$
 $1 : 2.4$

E.g. 3 The ratio of **bread to meat** in two brands of sausage are A 25 : 36 and B 40 : 72. Which has the higher proportion of meat? Explain your answer.

Working: Convert the ratios to 1 : n

Sausage A: divide both ratios by 25	$\frac{25}{25} : \frac{36}{25}$ 1 : 1.44 (3 s.f.)
Sausage B: divide both ratios by 40	$\frac{40}{40} : \frac{72}{40}$ 1 : 1.8

Sausage B has a higher proportion of meat because 1 : 1.8 is greater than 1 : 1.44.

[Video:](#) [Simplifying ratios](#)
[Video:](#) [Expressing as 1 : \$n\$](#)

Exercise

p115 Ex 7.1 Qu 1ace..., 2ace..., 3ac, 4-12

[Textbook answers \(only available during a lockdown\)](#)

