

M10 - 1.1 - SI/Imperial Equivalent Fractions Notes

How many centimeters around a 400m track?

$$\begin{array}{c} \xleftarrow{\times 400} \\ \text{Given} \rightarrow \frac{?}{400m} = \frac{100cm}{1m} \xleftarrow{\text{Conversion Factor}} \\ \xleftarrow{\times 400} \end{array}$$

$$100cm \times 400 = 40000cm$$

There are 40000 cm around a 400 m track.

How many centimeters in 2.4 m?

$$\begin{array}{c} \xleftarrow{\times 2.4} \\ \frac{?}{2.4m} = \frac{100cm}{1m} \xleftarrow{\text{Conversion Factor}} \\ \xrightarrow{\div 2.4} \end{array}$$

Divide in one direction on bottom,
multiply in other direction on top.

$$100cm \times 2.4 = 240cm$$

There are 240 cm in 2.4 m.

In order to figure out what number to divide
by, on your calculator: larger denominator
divided by smaller denominator gives scale
factor, $2.4 \div 1 = 2.4$

M10 - 1.2 - SI/Imperial Conversion Factors Notes

How many centimeters around a 400m track?

$$\begin{array}{c} 400\cancel{m} \times \boxed{\frac{100\cancel{cm}}{1\cancel{m}}} = 40000\cancel{cm} \\ \uparrow \qquad \qquad \uparrow \\ \text{Given} \qquad \text{Conversion Factor} \end{array}$$

$$\frac{m}{m} = 1$$

Cross it off.

Notice: choose a conversion factor that allows you to cross off the units you're given to get the units you want.

How many inches in 1m?

$$1\cancel{m} \times \boxed{\frac{100\cancel{cm}}{1\cancel{m}}} = 100\cancel{cm}$$

or

$$1\cancel{m} \times \boxed{\frac{100\cancel{cm}}{1\cancel{m}}} \times \boxed{\frac{1\cancel{in}}{2.54\cancel{cm}}} = \frac{100\cancel{in}}{2.54} = 39.37\cancel{in}$$

$$100\cancel{cm} \times \boxed{\frac{1\cancel{in}}{2.54\cancel{cm}}} = 39.37\cancel{in}$$

Notice: sometimes we need to use two conversion factors to get from what we are given to get the units we want or all in one step.

M10 - 1.2 - Conversion Factors vs. Eq Fractions Notes

How many centimeters around a 400m track?

$$400\cancel{m} \times \frac{100\cancel{cm}}{1\cancel{m}} = 40000cm$$

Cancel out same units

There are 40000 cm around a 400 m track.

$$\frac{?}{400m} = \frac{100cm}{1m} \quad \leftarrow \text{Conversion Factor}$$

× 400

$$100cm \times 400 = 40000cm$$

There are 40000 cm around a 400 m track.

How many centimeters in 2.4 m?

$$2.4\cancel{m} \times \frac{100\cancel{cm}}{1\cancel{m}} = 240 cm$$

Cancel out same units

There are 240 cm in 2.4 m.

Divide in one direction on bottom, multiply in other direction on top.

$$\frac{?}{2.4m} = \frac{100cm}{1m} \quad \leftarrow \text{Conversion Factor}$$

÷ 2.4

100cm × 2.4 = 240cm

There are 240 cm in 2.4 m.

In order to figure out what number to divide by, on your calculator: larger denominator divided by smaller denominator gives scale factor, 2.4 ÷ 1 = 2.4

M10 - 1.3 - Converting Squared and Cubed Units Notes

How many meters squared (m^2) in 2 kilometers squared (km^2)?

$$2\cancel{km}^2 \times \boxed{\frac{1000\cancel{m}}{1\cancel{km}}} \times \boxed{\frac{1000\cancel{m}}{1\cancel{km}}} = 2000000m^2$$

$$km^2 = \cancel{km} \times \cancel{km} \times \frac{m}{\cancel{km}} \times \frac{m}{\cancel{km}} = m^2$$

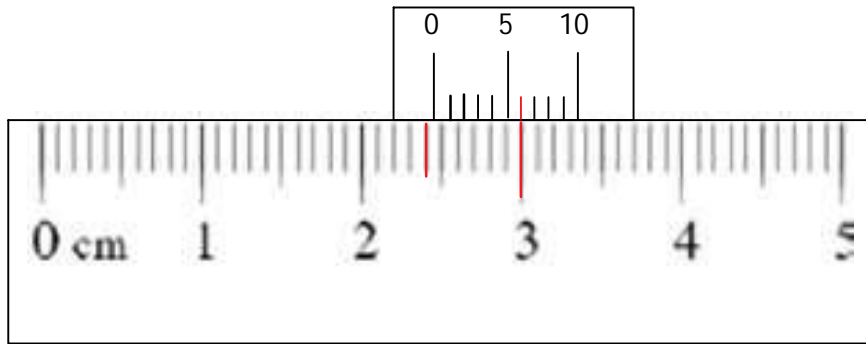
Notice: in order to cross off km^2 we must multiply by the conversion factor 2 times.

How many centimeters cubed (cm^3) in 1 meter cubed (m^3)

$$1\cancel{m}^3 \times \boxed{\frac{100\cancel{cm}}{1\cancel{m}}} \times \boxed{\frac{100\cancel{cm}}{1\cancel{m}}} \times \boxed{\frac{100\cancel{cm}}{1\cancel{m}}} = 1000000cm^3$$

Notice: in order to cross off m^3 we must multiply by the conversion factor 3 times.

M10 - 1.4 - Caliper Notes



We start by reading the large scale directly to the left of the zero on the small scale.

2.4

Find where the small scale and large scale match, which is the decimal.

0.06

Add.

2.46

Remember:
Watch out for
the small scale
decimal.

If the large scales smallest unit is 0.1, the smaller scales unit is 0.01.

$$(0.1 \times 0.1 = 0.01)$$

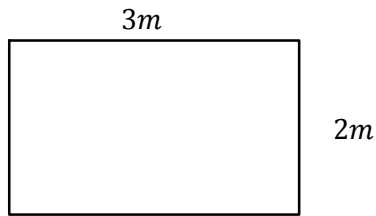
Small times big

$$\frac{1}{10} \times \frac{1}{10} = \frac{1}{100}$$

Inch, a decimal scale (with example 25 parts so $1/25\text{th}=0.04$) etc

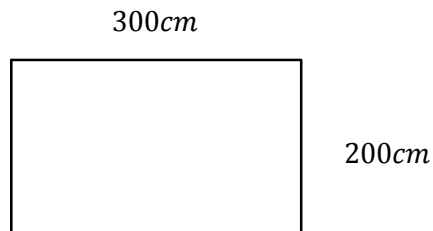
M10 - 1.5 - Conversion 1st vs 2nd Notes

Find the Area in cm^2



$$3m \times \frac{100cm}{1m} = 300cm$$

$$2m \times \frac{100cm}{1m} = 200cm$$



$$A = l \times w$$
$$A = 300 \times 200$$

$$A = 60000\text{cm}^2$$

Or!

$$A = l \times w$$
$$A = 3 \times 2$$
$$A = 6m^2$$
$$6m^2 \times \frac{100cm}{1m} \times \frac{100cm}{1m} = 60000\text{cm}^2$$