

9th March

Higher Plus 5-a-day



Corbettmaths

The length of the base of a triangle and its perpendicular height are:

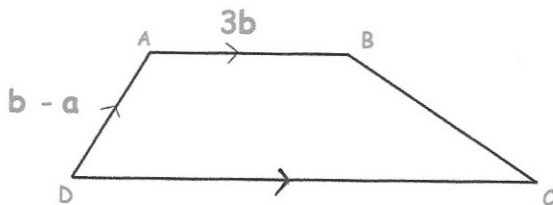
base: $\frac{x+5}{10}$ cm

height: $\frac{x-1}{4}$ cm

Find an expression for the area of the triangle.

$$\frac{1}{2} \times \frac{x+5}{10} \times \frac{x-1}{4} = \frac{(x+5)(x-1)}{80} \text{ cm}^2$$

ABCD is a trapezium



\vec{DC}

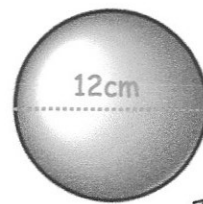
$6b$

AB and DC are parallel.
DC = 2AB

Write down these vectors in terms of **a** and **b**

$$\begin{aligned} \vec{BC} &= \vec{BA} + \vec{AD} + \vec{DC} \\ &= -3b + a - b + 6b \\ &= 2b + a \\ &\text{or } a + 2b \end{aligned}$$

A solid sphere has a diameter of 12cm.
The sphere is made from glass.
The density of the glass is 4.12g/cm³



$$\begin{aligned} V &= \frac{4}{3} \times \pi \times 6^3 \\ &= 288\pi \text{ cm}^3 \end{aligned}$$

Find the mass of the glass sphere.

$m = d \times v$

$$\begin{aligned} &288\pi \times 4.12 \\ &= 3727.7g \end{aligned}$$

y is inversely proportional to the cube of x

$$y = \frac{k}{x^3}$$

Find the percentage change in y when x is increased by 50%

$$\frac{1}{1.5^3} = 0.296296\dots$$

$$1 - 0.296296\dots = 0.7037\dots$$

70.4% decrease