10th April **Higher 5-a-day** Corbettmaths

y is inversely proportional to the cube of x.

If y = 4, x = 2.

Find y when x = 1.

$y \propto \frac{1}{x^3}$

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

$4 = \frac{k}{2^3}$

$4 = \frac{k}{8}$

$k = 32$

$y = \frac{32}{x^3}$

$y = \frac{32}{1^3} = 32$

The density of liquid A is 0.86g/cm³
The density of liquid B is 1.04g/cm³
20 litres of liquid A is mixed with 50 litres of liquid B to make liquid C.
Work out the density of liquid C.

20000 cm³

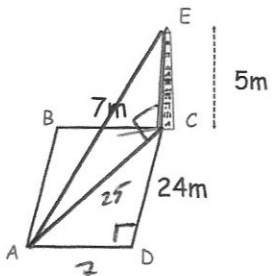
50000 cm³

$d = \frac{m}{v}$

$20000 \times 0.86 = 17200\text{g}$

$50000 \times 1.04 = 52000\text{g}$

$\frac{69200}{70000} = 0.989\text{ g/cm}^3$



*Sketch drawn from 3D perspective

An obelisk is situated in the corner of rectangular field ABCD.
Calculate the distance AE

$AC^2 = 7^2 + 24^2$

$AC^2 = 625$

$AC = 25\text{m}$

$AE^2 = 25^2 + 5^2$

$AE^2 = 650$

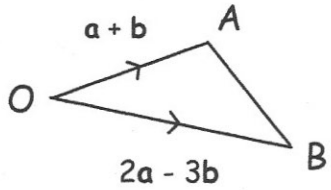
$AE = 25.495\text{m}$

Simplify

$\frac{x^2 + 10x + 24}{x^2 - 36}$

$\frac{(x+6)(x+4)}{(x+6)(x-6)}$

$\frac{x+4}{x-6}$



The vector $\overrightarrow{DE}$ is parallel to $\overrightarrow{BA}$.
$\overrightarrow{DE}$ is twice the length of $\overrightarrow{BA}$

Write down vector $\overrightarrow{DE}$ in terms of **a** and **b**.

$\overrightarrow{BA} = \overrightarrow{BO} + \overrightarrow{OA}$

$= 3\underline{b} - 2\underline{a} + \underline{a} + \underline{b}$

$= 4\underline{b} - \underline{a}$

$\overrightarrow{OE} = 8\underline{b} - 2\underline{a}$