21st July **Higher Plus 5-a-day**

Corbettmaths

Write 128 in the form 4^n

$(2^2)^n = 2^7$

$2^{2n} = 2^7$

$2n = 7$

$n = \frac{7}{2}$

$4^{\frac{7}{2}}$

The line AB has equation $4x + 3y = 9$

Find an equation of the line perpendicular to the line AB that passes through the point $(-3, -1)$

x y

$3y = -4x + 9$

$y = -\frac{4}{3}x + 3$

$y = \frac{3}{4}x + c$

$-1 = -\frac{9}{4} + c$

$c = \frac{5}{4}$

$y = \frac{3}{4}x + \frac{5}{4}$

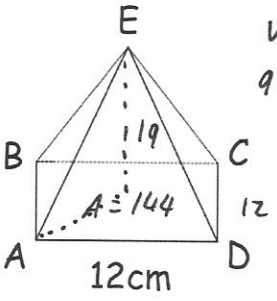
Shown is a square based pyramid.
E is directly over the centre of ABCD.
The volume of the pyramid is $912cm^3$

Find the length of AE.

$AC^2 = 12^2 + 12^2$

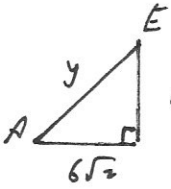
$AC = 12\sqrt{2}$

20.81cm



$V = \frac{1}{3}(144) \times h$

$912 = 48h$ $h = 19cm$



$y^2 = 19^2 + (6\sqrt{2})^2$

$y = 20.80865$

The equation $x^3 - 2x^2 + 19 = 0$ has a root in the interval $(-3, -2)$

Use an appropriate iteration formula to find an approximate to 1 decimal place for the root of
$x^3 - 2x^2 + 19 = 0$
in the interval $(-3, -2)$

$x^3 = 2x^2 - 19$

$x = \sqrt[3]{2x^2 - 19}$

$x_{n+1} = \sqrt[3]{2(x_n)^2 - 19}$

$x_0 = -2$

$x_1 = -2.22398091$

$x_2 = -2.08835773$

$x_3 = -2.17418335$

$x_4 = -2.12131381$

$x_5 = -2.15443865$

$x_6 = -2.13390086$

$x_7 = -2.14671896$

$x_8 = -2.13875156$

$x_9 = -2.14371581$

$x_{10} = -2.14062731$

$x = -2.1$