7th January **Higher Plus 5-a-day**

Corbettmaths

Expand and simplify

$(x+2)(x+5)(2x-1)$

$(x^2+7x+10)(2x-1)$

$2x^3-x^2+14x^2-7x+20x-10$

$2x^3+13x^2+13x-10$

The line l_1 has equation $y = 4x + 3$

The line l_2 has equation $5x + 2y - 9 = 0$

$2y = -5x+9$

$y = -\frac{5}{2}x+\frac{9}{2}$

Find the gradient of line l_2

$-\frac{5}{2}$

Find the coordinates of the point of intersection of l_1 and l_2

$4x+3 = -\frac{5}{2}x+\frac{9}{2}$

$8x+6 = -5x+9$

$13x = 3$

$x = \frac{3}{13}$ $y = 4\left(\frac{3}{13}\right)+3 = \frac{51}{13}$

$\left(\frac{3}{13}, \frac{51}{13}\right)$

Given that

$16^x = 4^{10-x}$

Find the value of x

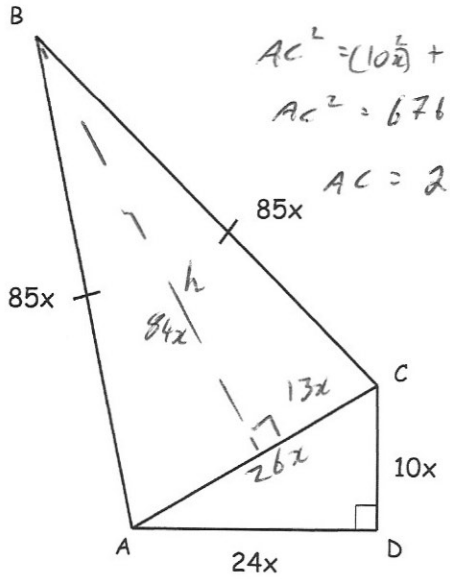
$(2^4)^x = (2^2)^{10-x}$

$2^{4x} = 2^{20-2x}$

$4x = 20-2x$

$6x = 20$

$x = \frac{20}{6} = \frac{10}{3}$



$AC^2 = (10\frac{2}{3})^2 + (24x)^2$

$AC^2 = 676x^2$

$AC = 26x$

Show the area of ABCD is $1212x^2$

$h^2 = (85x)^2 - (13x)^2$

$= 7225x^2 - 169x^2 = 7056x^2$

$h = 84x$

$\triangle ACD = \frac{1}{2} \times 24x \times 10x$

$= 120x^2$

$\triangle APC = \frac{1}{2} \times 26x \times 84x = 1092x^2$

$1092x^2 + 120x^2 = 1212x^2$