Name: _____ 5-a-day Further Maths

31st March

Corbettmaths

Make m the subject of $x = \dfrac{8a}{k-m}$

$kx - mx = 8a$

$kx - 8a = mx$

$m = \dfrac{kx - 8a}{x}$

$m = k - \dfrac{8a}{x}$

$f(x) = 10 + 3x - x^2$ for all values of x

Write down the range of $f(x)$

$f(x) = -[x^2 - 3x - 10]$

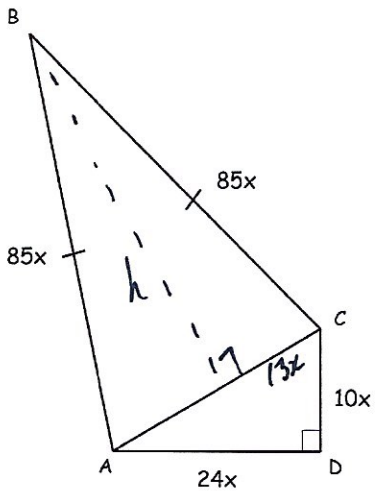
$= -[(x - \frac{3}{2})^2 - \frac{9}{4} - 10]$

$= -[(x - \frac{3}{2})^2 - \frac{49}{4}]$

$= -(x - \frac{3}{2})^2 + \frac{49}{4}$

$f(x) \leq \frac{49}{4}$

Shown below is quadrilateral ABCD.
ABC is an isosceles triangle.
ACD is a right angled triangle.



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

$AC^2 = (10x)^2 + (24x)^2$

$= 676x^2$

$AC = 26x$

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

$h = 84x$

Area $\triangle ADC$: $\frac{1}{2} \times 24x \times 10x$

$= 120x^2$

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

$1212x^2$ QED

$y = 4x^3 + ax$

The value of $\dfrac{dy}{dx}$ when x = –2 is seven times the value of $\dfrac{dy}{dx}$ when x = 1

$\frac{dy}{dx} = 12x^2 + a$

when $x = -2$ $\frac{dy}{dx} = 48 + a$

$x = 1$ $\frac{dy}{dx} = 12 + a$

$7(12 + a) = 48 + a$

$a = -6$