REFRESHING YOUR BASIC KNOWLEGE

1a If $y = 12x^2$ $\dfrac{dy}{dx} =$	**1b** If $\dfrac{dy}{dx} = 12x^2$ $y =$
2a If $y = x^5$ $\dfrac{dy}{dx} =$	**2b** If $\dfrac{dy}{dx} = x^5$ $y =$
3a If $y = 3x^4$ $\dfrac{dy}{dx} =$	**3b** If $\dfrac{dy}{dx} = 3x^4$ $y =$
4a If $y = \dfrac{x^3}{3}$ $\dfrac{dy}{dx} =$	**4b** If $\dfrac{dy}{dx} = \dfrac{x^3}{3}$ $y =$
5a If $y = (x + 7)(x - 9)$ $\dfrac{dy}{dx} =$	**5b** If $\dfrac{dy}{dx} = (x + 7)(x - 9)$ $y =$
6a Find the gradient of $y = x^2 - 6x$ at $x = 3$	**6b** If $\dfrac{dy}{dx} = x^2 - 6x$ find the equation for y given that the curve goes through (3, 10)
7a Find the gradient of $y = \dfrac{x^3}{3} + x^2$ at the point (3, 18)	**7b** Find the equation of the tangent to the curve $y = \dfrac{x^3}{3} + x^2$ at (3, 18)
8a Find the gradient of the tangent to $y = x^2 - 4x$ at the point (1, -3)	**8b** Find the equation of the tangent to $y = x^2 - 4x$ at the point (1, -3)

9 Find the x value of the point on the curve $y = x^2 - 6x + 8$ where the gradient is equal to 4

10 Find the x value of the point on the curve $y = x^2 - 6x + 8$ where the gradient is equal to 0.
Also do a sketch to verify whether this is a maximum point or a minimum point.

11 Find the x values of the points on the curve $y = 2x^3 - 6x^2 - 12$ where the gradient is equal to 0.
Also do a sketch to verify which value gives a maximum point and which value of x gives a minimum point.
Between what two x values is this function _decreasing?_

12 The height of a ball kicked vertically up is $h = 40t - 5t^2$.
Find the greatest height the ball will reach.