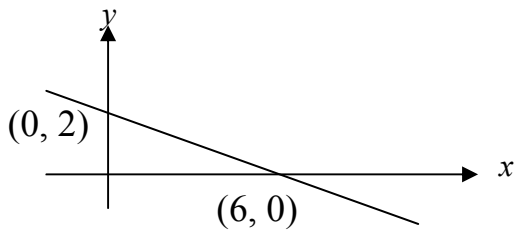
Differentiation_1_ (Non_Calculator)

1. If $f(x) = kx^3 + 5x - 1$ and $f'(1) = 14$, find the value of k. *(3)*

2. Find $\frac{dy}{dx}$ where $y = \frac{4}{x^2} + x\sqrt{x}$. *(4)*

3. The straight line in the diagram has equation $y = f(x)$.
Determine $f'(x)$



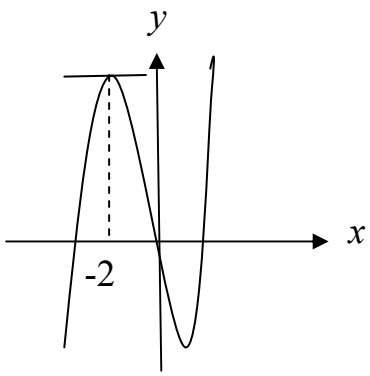
(2)

4. The point P(x, y) lies on the curve with equation $y = 6x^2 - x^3$.

(a) Find the value of x for which the gradient of the tangent at P is 12 *(5)*
(b) Hence find the equation of the tangent at P *(2)*

5. The diagram shows a sketch of the curve $y = x^3 + kx^2 - 8x + 3$. the tangent to the curve at $x = -2$ is parallel to the x-axis.

Find the value of k.



(4)

Total (20)