Q1. Given $y = (3x - 2)(2x + 4)$, calculate dy/dx when $x = 2$

Q2. Given $f(x) = \left(2x - \frac{4}{x}\right)^2$, calculate $f'(-2)$

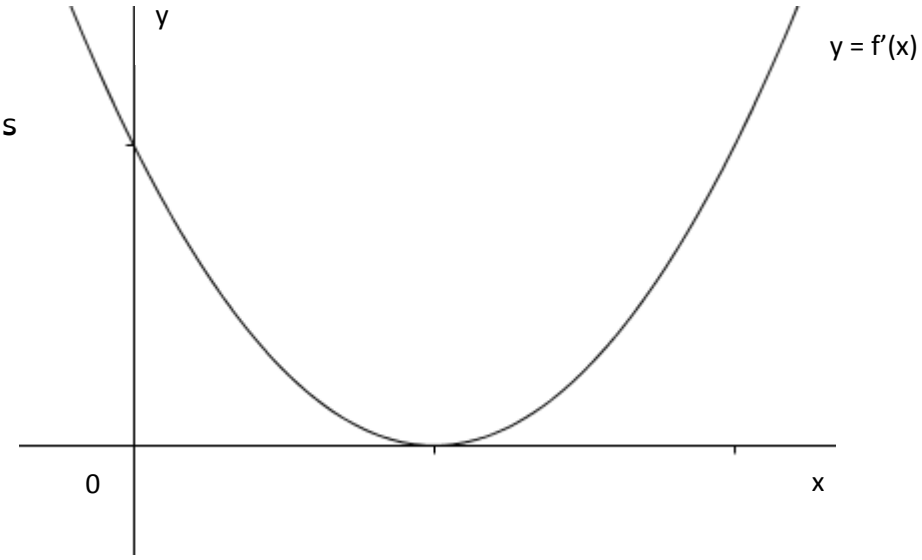
Q3. Find the equation of the tangent to the curve $y = x^3 + 2x^2 + 3x - 1$ at the point (-1, -3)

Q4. Find the equation of the tangent to the curve $f(x) = 2x^2 + 5x + 4$ at the point where $x = -1$

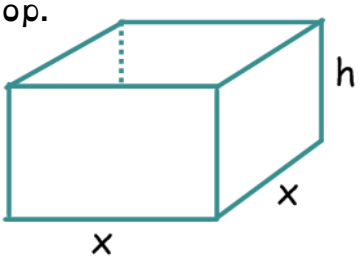
Q5. A curve has equation $y = x^3 - 6x$. There are two tangents to the curve that have a gradient of 6. Find the equations of each of these tangents.

Q6. The diagram shows the graph of $y = f'(x)$. The x – axis is a tangent to this graph.

Explain why the function f(x) Is never decreasing



Q7. A storage tank in the shape of a cuboid has a capacity of $108m^3$. It has a square base of side x metres with vertical sides and is open at the top.



(i) Express the height, h in terms of x.

(ii) Show that the surface area, S is given by $S = x^2 + \frac{432}{x}$

(iii) Find the dimensions of the tank if the surface area is to be a minimum.