PRACTICE 5.3 – The Chain Rule

* Full, worked solutions can be found in the folder linked on the Course Website ☺

Exercise 5G

1 Use the chain rule to find $\frac{dy}{dx}$ for each function.

a $y = (2x + 3)^5$ **b** $y = \sqrt{1 - 2x}$

c $y = \frac{-3}{\sqrt{2x^2 - 1}}$ **d** $y = 2\left(x^2 - \frac{2}{x}\right)^3$

2 Find the equation of the tangent to the curve $y = 6\sqrt[3]{1 - 2x}$ at $x = 0$.

3 Consider $y = \frac{a}{\sqrt{1 + bx}}$ where $a, b \in \mathbb{R}$ and $a > 0$.

Find a and b such that $\frac{dy}{dx} = \frac{-3}{8}$ at point $(1, 1)$.

4 Find the equation of the normal to the curve $y = \frac{4}{(3 - x)^3}$ at the point where $x = 1$.

5 Find the x-coordinates of all points on the curve $y = 1 - 3x^3 + 2x$ where the tangent to the curve is horizontal.