

Solution

$$y = 3x - 2x^2$$

$$\frac{dy}{dx} = 3 - 4x$$

At $x = 3$, the gradient of the curve is $3 - 4(3)$
 $= 3 - 12 = -9$.

\therefore the gradient of the normal is $\frac{1}{9}$.

Since $y = mx + c$,

$$\text{at } (3, -9), -9 = \frac{1}{9} \times 3 + c = \frac{1}{3} + c$$

$$\therefore c = -9 - \frac{1}{3} = -\frac{28}{3}$$