Differential Equations – Questions

Q1) For a particular function, it is known that $f'(x) = 3x^2 - 2x + 4$ and $f(-2) = 5$.
Find an expression for $f(x)$.

Q2) A curve is given by the equation $y = f(x)$. It is known that $f'(x) = 6\sqrt{x}$ and when $x = 4, y = 8$. Express y in terms of x.

Q3) A particular curve has equation $y = f(x)$. The point $(1, -20)$ lies on the curve and it is known that $\frac{dy}{dx} = 3x^2 + 10x - 2$. Find the equation of the curve.

Q4) For a curve with equation $y = f(x), f'(x) = \frac{2}{\sqrt{x}}$ and $f\left(\frac{1}{4}\right) = 3$.
Find the equation of the curve.

Q5) For a given function it is known that $\frac{dy}{dx} = x^2 - 6$ and when $x = -3, y = 7$.
Express y in terms of x.

Differential Equations – Solutions

Q1) $f(x) = x^3 - x^2 + 4x + 25$

Q2) $f(x) = 4x^{\frac{3}{2}} - 24$

Q3) $y = x^3 + 5x^2 - 2x - 24$

Q4) $f(x) = 4x^{\frac{1}{2}} + c$

Q5) $y = \frac{1}{3}x^3 - 6x - 2$