Worked Solutions

Pure Maths, Differential Calculus, sheet PM-DIFF-DF-01

The Power Rule (Derivative Formula) Q. 8

differentiate $y = \frac{x^2 - x - 3}{\sqrt{x}}$

dividing and simplifying exponents,

$$y = \frac{x^2}{x^{1/2}} - \frac{x}{x^{1/2}} - \frac{3}{x^{1/2}}$$

$$y = x^{3/2} - x^{1/2} - 3x^{-1/2}$$

applying the Power Rule:

$$\frac{d}{dx}\left[x^{n}\right] = nx^{n-1}$$

hence,

$$\frac{dy}{dx} = \frac{3}{2}x^{1/2} - \frac{1}{2}x^{-1/2} + \frac{3}{2}x^{-3/2}$$