

## Worked Solutions

Pure Maths, Differential Calculus,

sheet PM-DIFF-DF-01

### The Power Rule (Derivative Formula) Q. 2

differentiate  $y = 3x^2 - 4x^5$

the power rule states:

$$\frac{d}{dx} [x^n] = n \cdot x^{n-1}$$

$$\frac{dy}{dx} = \frac{d}{dx} [3x^2] - \frac{d}{dx} [4x^5]$$

$$\frac{d}{dx} [3x^2] = 3 \cdot \frac{d}{dx} [x^2] = 3 \cdot 2x^{2-1} = 6x$$

$$\frac{d}{dx} [4x^5] = 4 \cdot \frac{d}{dx} [x^5] = 4 \cdot 5x^{5-1} = 20x^4$$

substituting the differentiated terms back into the equation:

final answer:

$$\frac{dy}{dx} = 6x - 20x^4$$