

Mathematics N3

November 2012 9

Question 6

6.1

6.1.1.

$$y = \frac{1}{2}x^{-4} - 6x^{\frac{1}{3}} - \pi$$

$$\frac{dy}{dx} = \frac{1}{2} \cdot -4x^{-5} - 6 \cdot \frac{1}{3}x^{-2/3} - 0$$

$$= -\frac{2}{x^5} - \frac{2}{\sqrt[3]{x^2}}$$

$$= -\frac{2}{x^5} - \frac{2}{\sqrt[3]{x^2}}$$

6.1.2



$$y = (2 - \sqrt{x})^2$$

$$\frac{dy}{dx} = 2(2 - \sqrt{x}) \left(-\frac{1}{2}x^{-1/2}\right)$$

$$= 2(2 - \sqrt{x}) \cdot \frac{1}{\sqrt{x}}$$

$$= -\frac{(2 - \sqrt{x})}{\sqrt{x}}$$

6.2

$$y = x^2 + 4x - 8$$

$$\frac{dy}{dx} = 2x + 4$$

where  $x = -8$ , gradient =  $2(-8) + 4$   
 $= -12$

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