Exercise 12C Page 263-264

1 a) $f(x) = x^7$ $f'(x) = 7x^6$

1 k) $f(x) = \frac{1}{\sqrt{x}} = x^{-\frac{1}{2}}$ $f'(x) = -\frac{1}{2}x^{-\frac{3}{2}}$

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

1 j) $f(x) = \frac{1}{x^5} = x^{-5}$ $f'(x) = -5x^{-6}$

or $-\frac{5}{x^6}$

1 f) $f(x) = \sqrt[3]{x} = x^{\frac{1}{3}}$

$f'(x) = \frac{1}{3}x^{-\frac{2}{3}}$

2 a) $y = 3x^2$ $\frac{dy}{dx} = 6x$

2 j) $y = \sqrt{\frac{5x^4 \times 10x}{2x^2}}$

$y = \sqrt{50x^5} = \sqrt{25x^3} = 5x^{3/2}$

$\sqrt{2x^2}$ $\sqrt{25x} = 5\sqrt{x}$

$$\frac{dy}{dx} = \frac{3}{2} \times 5x^{\frac{1}{2}} = \frac{15\sqrt{x}}{2}$$

Exercise 12D Pages 265 – 266

1) a) $y = 2x^2 - 6x + 3$

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

b) $y = \frac{1}{2}x^2 + 12x$

$$\frac{dy}{dx} = x + 12$$

c) $y = 4x^2 - 6$

$$\frac{dy}{dx} = 8x$$

d) $y = 8x^2 + 7x + 12$

$$\frac{dy}{dx} = 16x + 7$$

e) $y = 5 + 4x - 5x^2$

$$\frac{dy}{dx} = 4 - 10x$$

2) a) $y = 3x^2$ at $(2, 12)$

$\frac{dy}{dx} = 6x$

At $(2, 12)$ $\frac{dy}{dx} = 6 \times 2 = 12$

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b) $y = x^2 + 4x$ at $(1, 5)$

$\frac{dy}{dx} =$