SECTION 3.5

3.5.1 Find $f'(x)$ where $f(x) = x^2(\sin 2x)^3$.

3.5.2 Find $f'(x)$ where $f(x) = \dfrac{3}{(x^2 - 2x + 2)^3}$.

3.5.3 Find $f'(x)$ where $f(x) = \sin(\tan 2x)$.

3.5.4 Find $f'(\theta)$ where $f(\theta) = (\theta + \sin 2\theta)^2$.

3.5.5 Find $f'(\theta)$ where $f(\theta) = \sin^2\left(2\theta^2 - \theta\right)^3$.

3.5.6 Find $f'\left(\dfrac{\pi}{12}\right)$ where $f(x) = \cos^3 2x$.

3.5.7 Find $f'\left(\dfrac{\pi}{8}\right)$ where $f(x) = \sin^2 2x$.

3.5.8 Find $f'(x)$ where $f(x) = \csc^3 4x$.

3.5.9 Find $f'(x)$ where $f(x) = \sec^2\left(3x - x^2\right)$.

3.5.10 Find $f'(x)$ where $f(x) = (x^2 - 3)^3(x^2 + 1)^2$.

3.5.11 Find $\dfrac{dy}{dx}$ where $y = (x + 4)^4(3x + 2)^3$.

3.5.12 Find $\dfrac{dy}{dx}$ where $y = \left(\dfrac{x+1}{x-1}\right)^2$.

3.5.13 Find $y'(\pi)$ where $y = \left(\dfrac{1}{x} + \sin x\right)^{-1}$.

3.5.14 Find $f'(t)$ where $f(t) = \left(\dfrac{1}{t} + \dfrac{1}{t^2}\right)^4$.

3.5.15 Find equations for the tangent and normal lines to the graph of $f(x) = \sin\left(4 - x^2\right)$ at $x = 2$.

3.5.16 Find equations for the tangent and normal lines to the graph of $f(x) = x\cos 4x$ at $x = \pi/4$.

3.5.17 Find $f'(x)$ where $f(x) = (x^4 + 3x)^{52}$

3.5.18 Find $f'(x)$ where $f(x) = \sqrt{x^5 + 2x + 3}$

3.5.19 Find $\dfrac{d}{dx}\left[x^2y^3 - \dfrac{x}{y^2}\right]$ in terms of x, y and $\dfrac{dy}{dx}$ assuming that y is a differentiable function of x.

3.5.20 Find $\dfrac{d}{dx}\left[\sin\sqrt{x^2 + y^2}\right]$ in terms of x, y and $\dfrac{dy}{dx}$ assuming that y is a differentiable function of x.

3.5.21 Find $\dfrac{d}{dt}\left[\tan(x^2\sqrt{y})\right]$ in terms of x, y, $\dfrac{dx}{dt}$ and $\dfrac{dy}{dt}$ assuming x and y are differentiable functions of t.

3.5.22 Given that $f(1) = 2$, $f'(1) = 4$ and $g(x) = (f(x))^{-3}$, find $g'(1)$.

3.5.23 Find $(f \circ g)'(0)$ if $f'(0) = 4$, $g(0) = 0$ and $g'(0) = 2$.