SECTION 4.3

4.3.1 Find $f'(x)$ if $f(x) = x^2\sqrt{x^2 + a^2}$, a = constant.

4.3.2 Find $f'(x)$ if $f(x) = (2 + \cos 2x)^{1/2}$.

4.3.3 Find $\dfrac{dy}{dx}$ if $y = (x + 4)^{1/4}(3x + 2)^{1/3}$.

4.3.4 Find $\dfrac{dy}{dx}$ if $y = (2x + 4)^4(3x - 2)^{7/3}$.

4.3.5 Find $\dfrac{dy}{dx}$ if $y = \left(\dfrac{a^2 - x^2}{a^2 + x^2}\right)^{2/3}$; a = constant.

4.3.6 Find $\dfrac{dy}{dx}$ if $\sin(x + y) = \tan xy$.

4.3.7 Find $\dfrac{dy}{dx}$ by implicit differentiation if $xy^2 + \sqrt{xy} = 2$.

4.3.8 Find $\dfrac{dy}{dx}$ by implicit differentiation if $x \sin y = y \cos 2x$.

4.3.9 Find $\dfrac{dy}{dx}$ by implicit differentiation if $a^2x^{3/4} + b^2y^{2/3} = c^2$; a, b, c are constants.

4.3.10 Use implicit differentiation to find $\dfrac{dy}{dx}$ if $\sin^2 xy \cos xy = 1$.

4.3.11 Find $\dfrac{dy}{dx}$ by implicit differentiation if $(x - y)^2 + 4x - 5y - 1 = 0$.

4.3.12 Find $\dfrac{dy}{dx}$ by implicit differentiation if $x^{-1/3} + y^{-1/3} = 1$.

4.3.13 Use implicit differentiation to find $\dfrac{dy}{dx}$ if $\tan^2(x^2y) = y$.

4.3.14 Find $\dfrac{d^2y}{dx^2}$ by implicit differentiation if $x^2 + 3y^2 = 10$.

4.3.15 Find $\dfrac{d^2y}{dx^2}$ by implicit differentiation if $x^2 + 2xy - y^2 + 8 = 0$.

4.3.16 Find the equation of the tangent and normal lines to $2x^2 - 3xy + 3y^2 = 2$ at $(1, 1)$.

4.3.17 Use implicit differentiation to find the equations of the tangent and normal lines to the ellipse $3x^2 + y^2 = 4$ at $(1, 1)$.

4.3.18 Use implicit differentiation to find the equations of the tangent and normal lines to the hyperbola $5x^2 - y^2 = 4$ at $(1, 1)$.

4.3.19 Use implicit differentiation to show that for any constants a and b, the hyperbolas $xy = a$ and $x^2 - y^2 = b$ intersect at right angles at the point (x_0, y_0).