

3.6

$$27) r = \sqrt{\theta \sin \theta}$$

$$r = (\theta \sin \theta)^{1/2}$$

$$r = u^{1/2}$$

$$\frac{dr}{d\theta} = \frac{1}{2} u^{-1/2} \frac{du}{d\theta}$$

$$= \frac{1}{2} (\theta \sin \theta)^{-1/2} [\sin \theta + \theta \cos \theta]$$

f g

$$u = \theta \sin \theta$$

$$du = \sin \theta + \cos \theta (\theta)$$

$$\frac{|x|}{1}$$

$$\frac{d}{dx} x^3$$

$$3x^2 \left(\frac{d}{dx} x \right) \frac{dx}{dx}$$

$$r = (\theta \sin \theta)^{1/2}$$

$$\frac{dr}{d\theta} = \frac{1}{2} (\theta \sin \theta)^{-1/2} [\sin \theta +$$

$$33) f(u) = u^5 + 1$$

$$f'(u) = 5u^4 du$$

$$f'(x) = 5(\sqrt{x})^4 \left[\frac{1}{2} x^{-1/2} \right]$$

$$f'(1) = 5(\sqrt{1})^4 \left[\frac{1}{2} (1)^{-1/2} \right]$$

$$= 5 \cdot 1 \cdot \frac{1}{2}$$

$$= \frac{5}{2}$$

$$u = g(x) = \sqrt{x} = x^{1/2} \quad x=1$$

$$x=1$$

$$du = \frac{1}{2} x^{-1/2}$$

3.6

$$15) y = \sin^{-5} x - \cos^3 x$$

$$y = (\sin x)^{-5} - (\cos x)^3$$

$$\frac{dy}{dx} = -5(\sin x)^{-6} [\cos x] - 3(\cos x)^2 [-\sin x]$$

$$39) (a) y = \cos u$$

$$\frac{dy}{du} = -\sin u \quad \frac{du}{dx}$$

$$\frac{dy}{dx} = -\sin(6x+2) [6]$$

$$= -6 \sin(6x+2)$$

$$u = 6x+2$$

$$\frac{du}{dx} = 6$$

$$y = \cos(6x+2)$$

$$u = 6x+2 \quad \left| \quad u = 3x+1 \right.$$

$$y = \cos u \quad \left| \quad y = \cos 2u \right.$$

$$(b) y = \cos 2u$$

$$\frac{dy}{du} = -\sin 2u \quad [2] \quad \frac{du}{dx}$$

$$\frac{dy}{dx} = -\sin [2(3x+1)] \cdot 2 \cdot 3$$

$$= -6 \sin(6x+2)$$

$$u = 3x+1$$

$$\frac{du}{dx} = 3$$

$$23) y = (1 + \cos^2 7x)^3$$

$$y' = 3(1 + \cos^2 7x)^2 [2(\cos 7x)] [-\sin 7x] [7]$$

$$1 + (\cos 7x)^2$$