27.1

(3) $y = \sin(x+2)$

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

(9) $y = 2\cos(3x-\pi)$

$y' = 2[-\sin(3x-\pi)](3)$

$= -6\sin(3x-\pi)$

(11) $r = \sin^2 3\pi\theta$

$r = [\sin(3\pi\theta)]^2$

$\frac{dr}{d\theta}$ or $r' = 2[\sin(3\pi\theta)]\cos(3\pi\theta)(3\pi)$

$= 6\pi\sin(3\pi\theta)\cos(3\pi\theta)$

(13) $y = 3\cos^3(5x+2)$

$y = 3[\cos(5x+2)]^3$

$y' = 9[\cos(5x+2)]^2[-\sin(5x+2)(5)]$

$= -45\cos^2(5x+2)\sin(5x+2)$

(15) $y = x\sin 3x$

$y' = x[(\cos 3x)(3)] + (\sin 3x)(1)$

$= 3x\cos 3x + \sin 3x$

(23) $r = \dfrac{\sin\left(3t - \frac{\pi}{3}\right)}{2t}$

$$\frac{dr}{dt} \text{ or } r' = \frac{2t\left[\cos\left(3t - \frac{\pi}{3}\right)(3)\right] - \sin\left(3t - \frac{\pi}{3}\right)(2)}{4t^2}$$

$$= \frac{6t\cos\left(3t - \frac{\pi}{3}\right) - 2\sin\left(3t - \frac{\pi}{3}\right)}{4t^2}$$

$$\text{or } \frac{3t\cos\left(3t - \frac{\pi}{3}\right) - \sin\left(3t - \frac{\pi}{3}\right)}{2t^2}$$

(41) $\sin(xy) + \cos 2y = x^2$

Take $\frac{d}{dx}$: $\cos(xy)\left[x\frac{dy}{dx} + y(1)\right] - 2\sin 2y \frac{dy}{dx} = 2x$

$$x\cos(xy)\frac{dy}{dx} + y\cos(xy) - 2\sin 2y \frac{dy}{dx} = 2x$$

$$[x\cos(xy) - 2\sin 2y]\frac{dy}{dx} = 2x - y\cos(xy)$$

$$\frac{dy}{dx} = \frac{2x - y\cos(xy)}{x\cos(xy) - 2\sin 2y}$$