

Pg 369

$$8. \quad y' = \sqrt{2}y \quad y(0) = 20$$

$$y = P_0 e^{\sqrt{2}t}$$

$$y = 20 e^{\sqrt{2}t}$$

$$14. \quad P_0 = 10 \quad t = 0$$

$$y = 3 \quad t = 17$$

$$y = 10 e^{kt}$$

$$3 = 10 e^{k(17)}$$

$$\frac{3}{10} = e^{17k}$$

$$\ln\left(\frac{3}{10}\right) = \ln(e^{17k})$$

$$\ln\left(\frac{3}{10}\right) = 17k \ln e$$

$$\frac{\ln\left(\frac{3}{10}\right)}{17} = k$$

$$k = \frac{1}{17} \ln\left(\frac{3}{10}\right)$$

$$k = -0.0708 \text{ years}$$

Pg 376

rt

$r = 9\%$

5.

$$y = Pe^{rt}$$

$$20000 = Pe^{0.09(5)}$$

$$20000 = Pe^{0.45}$$

$$\frac{20000}{e^{0.45}} = P$$

$$P = \$12752.56$$

Pg 355 # 34

$$f(x) = 4x^3 - 2x \quad b = -2$$

$$g(x) = f^{-1}(x)$$

$$g'(b) = \frac{1}{f'(a)}$$

$(-2, a)$ is on $g(x)$

so $(a, -2)$ is on $f(x)$

$$f'(x) = 12x^2 - 2$$

$$g'(-2) = \frac{1}{f'(-1)}$$

$$= \frac{1}{12(-1)^2 - 2}$$

$$= \frac{1}{10}$$

$$-2 = 4x^3 - 2x$$

$$0 = 4x^3 - 2x + 2$$

$$0 = 2x^3 - x + 1$$

$$\begin{array}{c|ccc} 1 & 2 & 0 & -1 & 1 \\ & & 2 & -2 & 1 \\ \hline & 2 & -2 & 1 & 0 \end{array}$$

$(x+1)$ is a factor
 $a = -1$

Pg AP 7-2 # 9

Continuous Growth

$$P = P_0 e^{rt}$$

$$r = 3\% = 0.03$$

$$P = P_0 e^{0.03t}$$

$$\frac{dP}{dt} = \underbrace{P_0 e^{0.03t}}_P \cdot (0.03)$$

$$\frac{dP}{dt} = P(0.03)$$

$$\frac{dP}{dt} = 0.03P$$

D