

r.6 WS 2

① a. 18,400
b. 21,600

② a. $58,100 = 53,700e^{4k}$

$$\frac{\ln\left[\frac{58,100}{53,700}\right]}{4} = \frac{4k}{4}$$

$$k = 0.01968$$

$$N(t) = 53,700e^{0.0197t}$$

b. 68,000

③ $P(t) = 0.5^{t/138}$
 $P(t) = 0.5^{730/138}$

$$P(t) = 2.56\%$$

④ $.75 = 0.5^{t/5730}$
 $\ln .75 = \frac{t}{5730} \ln .5$

$$(5730) \left[\frac{\ln .75}{\ln .5} \right] = \frac{t}{5730} (5730)$$

$$t = 2378 \text{ years old}$$

⑤ a. $A = 17,500 \left(1 + \frac{.0325}{1}\right)^7$

$$A = \$21,891.14$$

b. $A = 17,500 \left(1 + \frac{.0325}{1}\right)^{15}$

$$A = \$28,274.11$$

⑥ $A = 2P$
 $2P = P \left(1 + \frac{.02}{365}\right)^{365t}$

$$\ln 2 = 365t \ln 1$$

$$\frac{\ln 2}{\ln 1} = \frac{365t}{365}$$

$$t = 34.7 \text{ years}$$

⑦ $x \log 8 = \log 1000$
 $x = \frac{\log 1000}{\log 8}$

$$x = 3.32$$

⑧ $\log(x+2) = \log(7x)$

$$x+2 = 7x$$

$$2 = 6x$$

$$x = \frac{1}{3}$$

⑨ $\ln\left(\frac{x+7}{25}\right) = 0.9$

$$\frac{x+7}{25} = e^{0.9}$$

$$x+7 = e^{0.9}(25)$$

$$x = 54.49$$

⑩ $\log(x^2+3x) = 1$

$$x^2+3x = 10$$

$$x^2+3x-10 = 0$$

$$5 \hat{-} 2$$

$$x = -\cancel{5}, 2$$

$$x = 2$$

⑪ $(x+2) \log 5 = \log 4$

$$x+2 = \frac{\log 4}{\log 5}$$

$$x = \frac{\log 4}{\log 5} - 2$$

$$x = -1.14$$

$$(12) e^{-0.05x} = .01$$

$$-0.05x = \ln .01$$

$$x = \frac{\ln .01}{-0.05}$$

$$x = 92.1$$

$$(13) y = 7x + 21$$

$$\frac{y-21}{7} = \frac{7x}{7}$$

$$\frac{1}{7}y - 3 = x$$

$$f^{-1}(x) = \frac{1}{7}x - 3$$

$$D_x \text{ of } f^{-1}(x): (-\infty, \infty)$$

$$R_y \text{ of } f^{-1}(x): (-\infty, \infty)$$

$$(14) y^3 = x + 10$$

$$y^3 - 10 = x$$

$$f^{-1}(x) = x^3 - 10$$

$$D_x \text{ of } f^{-1}(x): (-\infty, \infty)$$

$$R_y \text{ of } f^{-1}(x): (-\infty, \infty)$$

$$(15) y = \frac{4}{13-x}$$

$$13y - xy = 4$$

$$\frac{-xy}{-y} = \frac{-13y+4}{-y}$$

$$x = 13 - \frac{4}{y}$$

$$f^{-1}(x) = 13 - \frac{4}{x}$$

$$D_x \text{ of } f^{-1}(x): (-\infty, 0) \cup (0, \infty)$$

$$R_y \text{ of } f^{-1}(x): (-\infty, 13) \cup (13, \infty)$$

$$(16) 4^2 = 16$$

$$(17) 10^{-3} = \frac{1}{1,000}$$

$$(18) e^{10} = x$$

$$(19) 3^4 = x + 8$$

$$(20) 2 = \log_8 64$$

$$(21) \log_5 125 = 3$$

$$(22) \ln 71.11 = 4.25$$

$$(23) \ln(2-x) = -2$$