

$$\textcircled{1} \log_{10}(8n+4) = 2$$

$$10^2 = 8n+4 \rightarrow 100 = 8n+4$$

$$\begin{array}{r} -4 \\ 96 = 8n \end{array}$$

$$\boxed{12 = n}$$

$$\textcircled{2} f(-2) = 3(-2) - 2 = -6 - 2 = \boxed{-8}$$

$$\textcircled{3} \ln_e(x-5) = 1$$

$$e^1 = x-5 \rightarrow e = x-5$$

$$\begin{array}{r} +5 \\ e+5 = x = \end{array} \boxed{7.718}$$

$$\textcircled{4} A = Pe^{rt}$$

$$A = 6500e^{.0725(10)} = \boxed{\$13,420.75}$$

$$\textcircled{5} \ln e^2 = 2 \boxed{\ln e} = 2(1) = \boxed{2}$$

$\ln e = 1$

$$\textcircled{6} \log \sqrt{x^3 y^{-4}} = \log (x^3 y^{-4})^{1/2}$$

$$\log (x^{3/2} y^{-2}) = \log (x^{3/2} \cdot y^{-2})$$

$$\log x^{3/2} + \log y^{-2} = \frac{3}{2} \log x - 2 \log y$$

$$\textcircled{7} \log \left( \frac{x^{15} y^{18}}{z^{19}} \right) = \log (x^{15} y^{18}) - \log z^{19}$$

$$\log x^{15} + \log y^{18} - \log z^{19}$$

$$15 \log x + 18 \log y - 19 \log z$$

$$\textcircled{8} \log_2 \frac{13}{17} = \log_2 13 - \log_2 17$$

$$\textcircled{9} w = \frac{k}{d^2} \rightarrow 50 = \frac{k}{3960^2}$$

15,681,600

$$50 = \frac{k}{15,681,600}$$

15,681,600

$$784,080,000 = k$$

$$W = \frac{784,080,000}{d^2}$$

$$W = \frac{784,080,000}{3970^2} = 49.75 \text{ pounds}$$

$$\textcircled{10} \log x - \frac{1}{2} \log y + 3 \log z$$

$$\log x - \log y^{1/2} + \log z$$

$$\log \left( \frac{x}{y^{1/2}} \right) + \log z$$

$$\log \left( \frac{xz}{y^{1/2}} \right) = \log \left( \frac{xz}{\sqrt{y}} \right)$$

$$\textcircled{11} 2 \log x + 3 \log (x+1)$$

$$\log x^2 + \log (x+1)^3$$

$$\log (x^2 (x+1)^3)$$

$$(12) A = Pe^{rt}$$

$$A = 500e^{.06(25)} = \boxed{\$2,240.84}$$

$$(13) \ln(3x) = 2$$

$$\frac{e^2}{3} = \frac{3x}{3} \rightarrow \frac{e^2}{3} = \boxed{x = 2.463}$$

$$(14) \log_{10}(0.001) = x$$

$$10^x = 0.001 \rightarrow 10^x = \frac{1}{1000} = 10^{-3}$$

$$\cancel{10^x = 10^{-3}}$$

$$\boxed{x = -3}$$

$$(15) \log_2 \frac{1}{32} = x$$

$$2^x = \frac{1}{32} = 2^{-5} \rightarrow \cancel{2^x = 2^{-5}}$$

$$\boxed{x = -5}$$

$$(16) \quad y = kx \rightarrow \frac{12}{3} = \frac{k(3)}{3} \rightarrow k = 4$$

$$y = 4x \rightarrow y = 4(20) \rightarrow y = 80$$

$$(17) \quad y = a \cdot b^x$$

$$y = a(1+r)^x \rightarrow y = 10000(1+0.025)^x$$

$$(18) \quad x^{10/13} = y$$

$$\log_x y = \frac{10}{13}$$

$$(19) \quad \log_y 137 = x$$

$$y^x = 137$$

$$(20) \quad \frac{2 \cdot 10^{9a}}{2} = \frac{29}{2} \rightarrow 10^{9a} = 14.5$$

$$\log_{10}(14.5) = 9a$$

$$\frac{\log_{10}(14.5)}{9} = a = 0.129$$

$$(21) \quad y = a\left(\frac{1}{2}\right)^{t/h}$$

$$y = 200\left(\frac{1}{2}\right)^{x/10.4}$$

$$(22) \quad y = kx \rightarrow \frac{12}{6} = k\left(\frac{6}{6}\right) \rightarrow k = 2$$

$$y = 2x \rightarrow y = 2(16) \rightarrow y = 32$$

$$(23) \quad \log(4x^2 - 10) + \log 3 = \log 51$$

*condense*

$$\log(3(4x^2 - 10)) = \log 51$$

$$\log(12x^2 - 30) = \log 51$$

*equal*

$$12x^2 - 30 = 51$$

$$\frac{12x^2}{12} = \frac{81}{12} \rightarrow x^2 = \frac{27}{4}$$

$$x = \frac{\pm 3\sqrt{3}}{2}$$

$$\textcircled{24} \quad y = a \cdot b^x \rightarrow y = a(1-r)^x$$

$$y = 30000(1-0.13)^7 = \$11,317.64$$

$$\textcircled{25} \quad y = a \cdot b^x \rightarrow y = a(1+r)^x$$

$$y = 550(1+0.055)^x$$

$$\textcircled{26} \quad y = a\left(\frac{1}{2}\right)^{t/h}$$

$$y = 550\left(\frac{1}{2}\right)^{19/20} = 284.79$$