

## Quiz Review Answers - Natural logs / e

$$\textcircled{1} \ln 64 = x$$

$$\textcircled{2} \ln y = x + 5$$

$$\textcircled{3} e^q = x \quad \begin{matrix} z = \ln x - 7 \\ +7 \end{matrix} \quad q = \ln x$$

$$\textcircled{4} e^{5x} = 40$$

$$\textcircled{5} \log_3 x^2 + \log_3 y^{1/2} - \log_3 z^7 = \boxed{2 \log_3 x + \frac{1}{2} \log_3 y - 7 \log_3 z}$$

$$\begin{aligned} \textcircled{6} 3[\log_5(2x^2b^3z)] &= 3[\log_5 2 + 2\log_5 x + 3\log_5 b + \log_5 z] \\ &= \boxed{3 \log_5 2 + 6 \log_5 x + 9 \log_5 b + 3 \log_5 z} \\ &\text{OR} \\ &= \boxed{\log_5 8 + 6 \log_5 x + 9 \log_5 b + 3 \log_5 z} \end{aligned}$$

$$\textcircled{7} \frac{1}{2} \log(x-2) - \log z$$

$$\textcircled{8} \log 5 + 3 \log a + \log b - \log 8$$

$$\textcircled{9} \log 2^3 + \log x^2 + \log z = \boxed{\log 8x^2z}$$

$$\textcircled{10} \log_2 a^5 + \log_2 7 - \log_2 x - \log_2 9 = \boxed{\log_2 \frac{7a^5}{9x}}$$

$$\textcircled{11} \log 9^{2/3} + \log x^{1/2} - \log y = \boxed{\log \frac{\sqrt[3]{81} \sqrt{x}}{y}}$$

$$\textcircled{12} \log 8^{1/2} - \log x^5 - \log x^3 = \log \frac{\sqrt{8}}{x^5 x^3} = \boxed{\log \frac{2\sqrt{2}}{x^8}}$$

$$(13) \quad e^{x+1} - 7 = 20$$

$$\ln e^{x+1} = \ln 27$$

$$x+1 = 3.3$$

$$x = 2.3$$

$$\boxed{x = 2.3}$$

$$(14) \quad 3e^x + 7 = 28$$

$$\frac{3e^x}{3} = \frac{21}{3}$$

$$\ln e^x = \ln 7$$

$$x = 1.9$$

$$\boxed{x = 1.9}$$

$$(15) \quad 3 = e^{\ln(12+4x)}$$

$$20.1 = 12 + 4x$$

$$\frac{-12}{-4} = \frac{-12}{-4}$$

$$8.1 = 4x$$

$$2.1 = x$$

$$\boxed{x = 2.1}$$

$$(16) \quad \frac{-2e^x}{-2} = \frac{-34}{-2}$$

$$\ln e^x = \ln 17$$

$$x = 2.8$$

$$\boxed{x = 2.8}$$

$$(17) \quad \ln x(x+3) = \ln(x+9)$$

$$x(x+3) = x+9$$

$$x^2 + 3x = x + 9$$

$$x^2 + 2x - 9 = 0$$

$$(x+4)(x-2) = 0$$

$$x = -4, 2$$

$$\boxed{x = -4, 2}$$

$$(18) \quad \ln(2x+7) = \ln(x-10)$$

$$2x+7 = x-10$$

$$x = -17$$

$\boxed{\text{No solution}}$

(Can't take  $\ln$  of negative #)

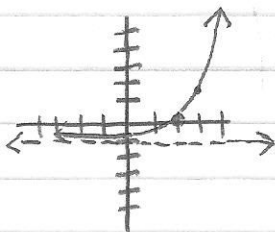
$$(19) \quad \ln(x+2) = 4$$

$$x+2 = 54.6$$

$$x = 52.6$$

$$\boxed{x = 52.6}$$

(20)



Trans: right 2, down 1

D:  $(-\infty, \infty)$  R:  $(-1, \infty)$

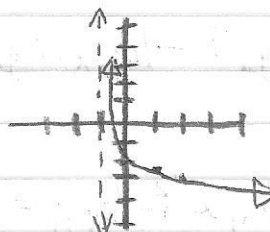
Asymptote:  $y = -1$

X-int:  $(2, 0)$

Y-int:  $(0, -1)$

Calculator  
table

(21)



Trans: reflect over x, left 1, down 2

D:  $(-1, \infty)$  R:  $(-\infty, \infty)$

Asymptote:  $x = -1$

X-int:  $(-1, 0) \rightarrow -\ln(x+1) - 2 = 0$

Y-int:  $(0, -2)$

$-\ln(x+1) = 2$

$e^{-\ln(x+1)} = e^2$   $x = -86$   
 $x+1 = .14$   $x = .9$