1. Solve the logarithmic equation and round your answer to the nearest hundredth.

$$\ln(c-9) + \ln(c-7) = \ln(c-4)$$

A. $c \approx 11.03$

B. $c \approx 10.21$

C. $c \approx 11.1$

D. $c \approx 9.96$

E. $c \approx 10.01$

F. $c \approx 10.02$

G. $c \approx 10.79$

H. This equation has no solutions.

2. Find the exact solution to the equation. Express your answer in terms of base-10 logarithms.

$$2^{3\alpha - 9} = 4$$

A. $\alpha = \frac{1}{9}\left(\frac{\log(2)}{\log(4)} - 3\right)$

B. $\alpha = \frac{1}{3}\left(\frac{\log(4)}{\log(2)} + 9\right)$

C. $\alpha = \frac{1}{3}\left(\frac{\log(4)}{\log(2)} - 9\right)$

D. $\alpha = \frac{\log(2)}{9\log(4)} + 3$

E. $\alpha = \frac{\log(4)}{3\log(2)} + 9$

F. $\alpha = \frac{\log(4)}{3\log(2)} - 9$

G. $\alpha = \frac{1}{9}\left(\frac{\log(2)}{\log(4)} + 3\right)$

H. $\alpha = \frac{\log(2)}{9\log(4)} - 3$

3. Solve the exponential equation and round your answer to the nearest hundredth.

$$9.35e^{0.05y} = 9.36$$

A. $y \approx 0.86$

B. $y \approx -0.42$

C. $y \approx 0.02$

D. $y \approx 0.54$

E. $y \approx 0.16$

F. $y \approx -0.41$

G. $y \approx -0.51$

H. $y \approx -0.33$

4. Find the exact solution to the equation. Express your answer in terms of base-10 logarithms.

$$2^{7\omega-8} = 5^{6\omega+9}$$

A. $\omega = \dfrac{7\log 2 - 6\log 5}{8\log 2 + 9\log 5}$

B. $\omega = \dfrac{8\log 2 + 9\log 5}{7\log 2 - 6\log 5}$

C. $\omega = \dfrac{7\log 5 - 6\log 2}{8\log 5 - 9\log 2}$

D. $\omega = \dfrac{7\log 2 - 6\log 5}{8\log 2 - 9\log 5}$

E. $\omega = \dfrac{8\log 5 + 9\log 2}{7\log 5 - 6\log 2}$

F. $\omega = \dfrac{8\log 2 - 9\log 5}{7\log 2 - 6\log 5}$

G. $\omega = \dfrac{8\log 5 - 9\log 2}{7\log 5 - 6\log 2}$

H. $\omega = \dfrac{7\log 5 - 6\log 2}{8\log 5 + 9\log 2}$

5. Solve the exponential equation and round your answer to the nearest hundredth.

$$7^{2s-4} = 9^{3s-8}$$

A. $s \approx 3.97$

B. $s \approx 2.86$

C. $s \approx 3.01$

D. $s \approx 3.19$

E. $s \approx 4.38$

F. $s \approx 2.77$

G. $s \approx 3.63$

H. $s \approx 3.82$

6. The value V of a particular model of automobile after t years of depreciation is given by the formula

$$V = 34000e^{-0.2t} + 1000.$$

Approximately how many years will it take for the value to depreciate to \$12000? Round your answer to the nearest hundredth.

A. It will take approximately $t = 4.87$ years.

B. It will take approximately $t = 5.91$ years.

C. It will take approximately $t = 5.76$ years.

D. It will take approximately $t = 5.23$ years.

E. It will take approximately $t = 4.68$ years.

F. It will take approximately $t = 4.91$ years.

G. It will take approximately $t = 5.39$ years.

H. It will take approximately $t = 5.64$ years.

7. Solve the exponential equation and round your answer to the nearest hundredth.

$$8.22e^{-0.85\omega} = 0.33$$

A. $\omega \approx 3.15$

B. $\omega \approx 3.78$

C. $\omega \approx 3.24$

D. $\omega \approx 4.52$

E. $\omega \approx 3.31$

F. $\omega \approx 4.43$

G. $\omega \approx 4.29$

H. $\omega \approx 2.85$

8. Find the exact solution to the equation. Express your answer in terms of natural logarithms.

$$2^{6n+3} = 9^{4n-8}$$

A. $n = \frac{-3\ln 9 - 8\ln 2}{6\ln 9 - 4\ln 2}$

B. $n = \frac{6\ln 2 - 4\ln 9}{-3\ln 2 + 8\ln 9}$

C. $n = \frac{-3\ln 2 - 8\ln 9}{6\ln 2 - 4\ln 9}$

D. $n = \frac{-3\ln 9 + 8\ln 2}{6\ln 9 - 4\ln 2}$

E. $n = \frac{6\ln 9 - 4\ln 2}{-3\ln 9 - 8\ln 2}$

F. $n = \frac{6\ln 2 - 4\ln 9}{-3\ln 2 - 8\ln 9}$

G. $n = \frac{-3\ln 2 + 8\ln 9}{6\ln 2 - 4\ln 9}$

H. $n = \frac{6\ln 9 - 4\ln 2}{-3\ln 9 + 8\ln 2}$