Section 3.1-3.2

1. Rewrite each of the following in the equivalent logarithmic form.

a. $b^3 = 1000$ **b.** $7^y = 201$ **c.** $e^9 = z$

2. Rewrite each of the following in the equivalent exponential form.

a. $\log_5(125) = y$ **b.** $5 = \log_b(32)$ **c.** $41 = \ln(x)$

3. State the domain for each of the following.

a. $f(x) = \log(x)$ **b.** $g(x) = \ln(2 - x)$ **c.** $g(x) = \log_{12}(4x + 8)$

Section 3.3

4. Use the properties of logarithms to rewrite each of the following as a sum and difference of logarithms with no exponents.

a. $\log\left(\sqrt{100x}\right)$ **b.** $\log_6\left(\dfrac{36}{\sqrt{x+1}}\right)$ **c.** $\ln\left(e^{15}\sqrt[5]{x-1}\right)$

5. Use the properties of logarithms to rewrite each of the following as a single logarithm.

a. $4\ln(x+6) - 3\ln(x)$

b. $\dfrac{1}{2}\left(\log_4(x) + \log_4(y)\right)$.

c. $3\log(x) - 4\log(y) + 5\log(z)$

Section 3.4

6. Solve the following for x. (If necessary, round your answers to two decimal places). Be sure to check that your answers make sense.

a. $7^{x+2} = 410$ **b.** $\log_6(x+5) + \log_6(x) = 2$ **c.** $e^{2x} - 2e^x - 3 = 0$

7. Suppose you invest $\$20,000$ into an account with an interest rate of 5.1%.

a. Write an equation for the value of the account after t years, assuming it is compounded *monthly*.

b. Write an equation for the value of the account after t years, assuming it is compounded *continuously*.

c. Find the value of the account after 10 years, assuming it is compounded *monthly*.

d. How long, in years will it take for the account to reach a value of $\$100,000$, assuming it is compounded *continuously*? Round your answer to two decimal places.

Section 4.1

8. Convert each of the following angle measures into radians. Express each as a multiple of π.

a. $-330°$ **b.** $36°$ **c.** $135°$

9. Convert each of the following radian angle measures into degrees. (If necessary, round your answer to two decimal places)

a. -1000π **b.** 6 **c.** $\frac{7\pi}{8}$

Section 4.2

10. Given that $\cos(\theta) = -\frac{3}{5}$ and that θ is in Quadrant III, find each of the following exactly.

a. $\sin(\theta)$ **b.** $\tan(\theta)$ **c.** $\sec(\theta)$ **d.** $\csc(\theta)$

11. Draw and label the unit circle and important angles. (You should be able to do this without a calculator.)

Section 4.5-4.6

12. Let $f(\theta) = -5\cos\left(2\theta + \frac{\pi}{4}\right)$.

a. What is the amplitude?

b. What is the period?

c. What is the phase shift?

d. Graph at least one period of f. (You should be able to do this without a calculator.)

13. Let $f(\theta) = 2\sin\left(\frac{\pi}{2}\theta - \pi\right)$.

a. What is the amplitude?

b. What is the period?

c. What is the phase shift?

d. Graph at least one period of f. (You should be able to do this without a calculator.)

Section 4.7

14. Find the exact value of each.

a. $\sin^{-1}\left(\sin\left(\frac{2\pi}{3}\right)\right)$ **b.** $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$ **c.** $\cos\left(\tan^{-1}\left(\frac{2}{3}\right)\right)$.

Section 4.8

15. Solve the right triangle below. Round your answers to two decimal places when necessary.