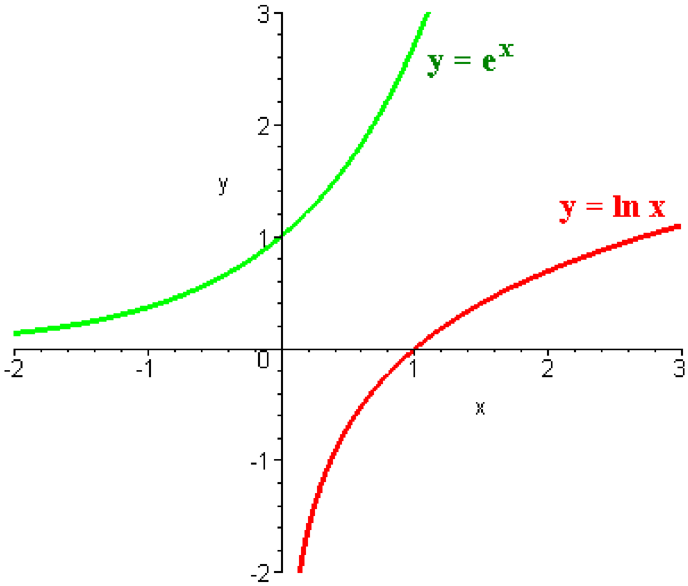
Precalculus Review - Group Activity Problems

1.3 Exponential, Logarithmic Functions Review



Review: properties of ln

1) $\ln(ab) = \ln a + \ln b$

2) $\ln \dfrac{a}{b} = \ln a - \ln b$

3) $\ln a^k = k \ln a$

4) $\ln e = 1$

5) $\ln 1 = 0$

19. Evaluate each expression without a calculator.

a. $\log_{10} 1000$ **b.** $\log_2 16$ **c.** $\log_{10} 0.01$ **d.** $\ln e^3$ **e.** $\ln \sqrt{e}$

45–50. Properties of logarithms *Assume* $\log_b x = 0.36$, $\log_b y = 0.56$, *and* $\log_b z = 0.83$. *Evaluate the following expressions.*

45. $\log_b \dfrac{x}{y}$

46. $\log_b x^2$

47. $\log_b xz$

48. $\log_b \dfrac{\sqrt{xy}}{z}$

51–60. Solving equations *Solve the following equations.*

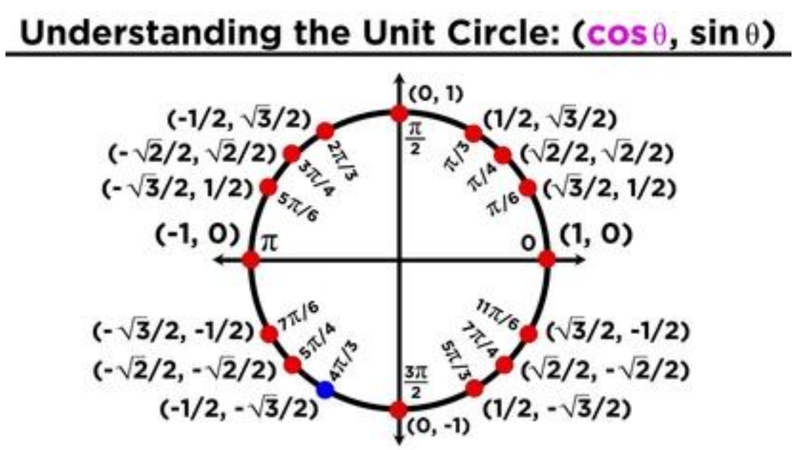
59. $3^{3x-4} = 15$ **60.** $5^{3x} = 29$

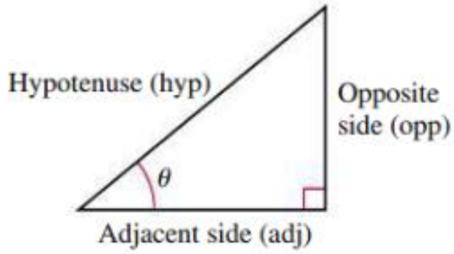
77. Explain why or why not Determine whether the following statements are true and give an explanation or counterexample.

a. If $y = 3^x$, then $x = \sqrt[3]{y}$.

b. $\dfrac{\log_b x}{\log_b y} = \log_b x - \log_b y$

1.4 Trigonometric Functions Review



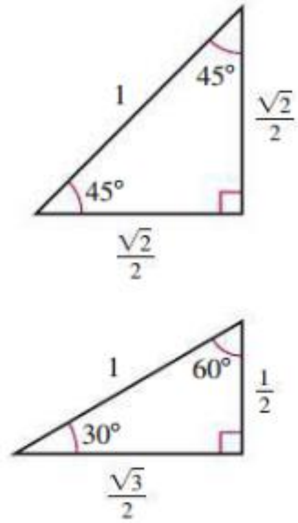


$$\sin\theta = \frac{\text{opp}}{\text{hyp}} \quad \cos\theta = \frac{\text{adj}}{\text{hyp}}$$

$$\tan\theta = \frac{\text{opp}}{\text{adj}} \quad \cot\theta = \frac{\text{adj}}{\text{opp}}$$

$$\sec\theta = \frac{\text{hyp}}{\text{adj}} \quad \csc\theta = \frac{\text{hyp}}{\text{opp}}$$

Standard triangles



Trigonometric Identities

Reciprocal Identities

$$\tan\theta = \frac{\sin\theta}{\cos\theta} \qquad \cot\theta = \frac{1}{\tan\theta} = \frac{\cos\theta}{\sin\theta}$$

$$\csc\theta = \frac{1}{\sin\theta} \qquad \sec\theta = \frac{1}{\cos\theta}$$

Pythagorean Identities

$$\sin^2\theta + \cos^2\theta = 1 \qquad 1 + \cot^2\theta = \csc^2\theta \qquad \tan^2\theta + 1 = \sec^2\theta$$

Solve the following equations:

36. $2\theta\cos\theta + \theta = 0$

38. $\cos^2\theta = \frac{1}{2}, 0 \leq \theta < 2\pi$

91. Explain why or why not Determine whether the following statements are true and give an explanation or counterexample.

a. $\sin(a + b) = \sin a + \sin b$

b. The equation $\cos\theta = 2$ has multiple solutions.

92–95. One function gives all six *Given the following information about one trigonometric function, evaluate the other five functions.*

92. $\sin\theta = -\frac{4}{5}$ and $\pi < \theta < \frac{3\pi}{2}$

94. $\sec\theta = \frac{5}{3}$ and $\frac{3\pi}{2} < \theta < 2\pi$