

BLC

190: Review for Quiz 2

Practice Quiz A

1. Simplify: $\frac{\sqrt{x^4 y^2}}{x y^{-2}}$

$$= \frac{(x^4 y^2)^{1/2}}{x y^{-2}} = \frac{x^2 y}{x y^{-2}} = \boxed{x y^3}$$

2. Solve the following equation:

$$\begin{aligned} x^{2/3} &= 9 \\ (x^{1/3})^2 &= 9 \\ x^{1/3} &= \pm 3 \\ x &= (\pm 3)^3 \\ \boxed{x} &= \pm 27 \end{aligned}$$

3. Evaluate the following: $\log_2(8)$

$$\log_2(8) = \log_2(2^3) = \boxed{3}$$

4. Solve the following equation:

$$3^x = 5$$

either answer is correct

$$x = \log_3(5)$$
$$x = \frac{\ln(5)}{\ln(3)} \rightarrow x \approx 1.46$$

5. If $f(x) = \sin x$ and $g(x) = 3x + \sqrt{x}$, what is $f(g(x))$?

$$f(g(x)) = f(3x + \sqrt{x}) = \sin(3x + \sqrt{x})$$

6. Convert $\frac{\pi}{10}$ radians to degrees.

$$\frac{\pi}{10} \times \frac{180}{\pi} = \frac{180}{10} = 18^\circ$$

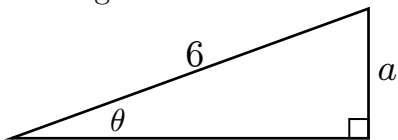
7. Consider the following right triangle:



What is $\cos \theta$?

$$\cos \theta = \frac{\text{adj}}{\text{hyp}} = \frac{5}{13}$$

8. Consider the following right triangle:



If $\theta = \frac{\pi}{6}$ radians, what is a ?

$$\sin\left(\frac{\pi}{6}\right) = \frac{a}{6}$$

$$a = 6 \sin\left(\frac{\pi}{6}\right) = 6\left(\frac{1}{2}\right) = \boxed{3}$$

9. Use the unit circle to evaluate the following: $\tan\left(\frac{\pi}{3}\right)$

$$\tan\left(\frac{\pi}{3}\right) = \frac{\sin\left(\frac{\pi}{3}\right)}{\cos\left(\frac{\pi}{3}\right)} = \frac{\sqrt{3}/2}{1/2} = \boxed{\sqrt{3}}$$

10. If $\sin\theta = \frac{1}{2}$, use the unit circle to determine all possible values of θ ? Give the exact answers.

From the unit circle:

$$\theta = \frac{\pi}{6} + 2\pi n, \frac{5\pi}{6} + 2\pi n$$

where n is any integer

Practice Quiz B

1. Simplify: $\frac{x(x^2y^3)^2}{x^{-1}y^4} = \frac{x(x^4y^6)}{x^{-1}y^4} = \frac{x^5y^6}{x^{-1}y^4} = \boxed{x^6y^2}$

2. Solve the following equation:

$$\begin{aligned}x^{-1/2} &= 2 \\ \frac{1}{\sqrt{x}} &= 2 \\ 1 &= 2\sqrt{x} \\ \frac{1}{2} &= \sqrt{x} \\ \left(\frac{1}{2}\right)^2 &= x\end{aligned}$$

$\boxed{x = \frac{1}{4}}$

3. Evaluate the following: $\log_9(3)$

$$\log_9(3) = \log_9(9^{1/2}) = \boxed{\frac{1}{2}}$$

4. Solve the following equation:

$$2e^x = 8$$
$$e^x = 4$$
$$\ln(e^x) = \ln(4)$$
$$x = \ln(4)$$

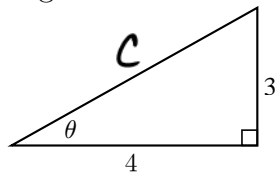
5. If $f(x) = \sqrt{x}$ and $g(x) = x^3 + 2x$, what is $g(f(x))$?

$$g(f(x)) = g(\sqrt{x}) = (\sqrt{x})^3 + 2\sqrt{x}$$

6. Convert 20° to radians. Give your answer as a fraction involving π .

$$20 \times \frac{\pi}{180} = \frac{20\pi}{180} = \frac{2\pi}{18} = \frac{\pi}{9} \text{ radians}$$

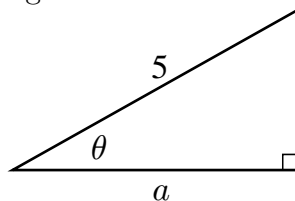
7. Consider the following right triangle:



What is $\sin \theta$?

$$c^2 = 3^2 + 4^2 = 9 + 16 = 25$$
$$c = 5$$
$$\sin \theta = \frac{\text{opp}}{\text{hyp}} = \frac{3}{5}$$

8. Consider the following right triangle:



If $\theta = \frac{\pi}{4}$ radians, what is a ?

$$\cos\left(\frac{\pi}{4}\right) = \frac{a}{5}$$
$$a = 5 \cos\left(\frac{\pi}{4}\right) = 5 \left(\frac{\sqrt{2}}{2}\right) = \boxed{\frac{5\sqrt{2}}{2}} \approx \boxed{3.54}$$

9. Use the unit circle to evaluate the following: $\sec\left(\frac{5\pi}{6}\right)$

$$\sec\left(\frac{5\pi}{6}\right) = \frac{1}{\cos(5\pi/6)} = \frac{1}{-\sqrt{3}/2} = \boxed{-\frac{2}{\sqrt{3}}}$$

10. If $\cos \theta = -\frac{\sqrt{3}}{2}$, use the unit circle to determine all possible values of θ ? Give the exact answers.

$$\theta = \frac{5\pi}{6} + 2\pi n, \frac{7\pi}{6} + 2\pi n$$

where n is any integer