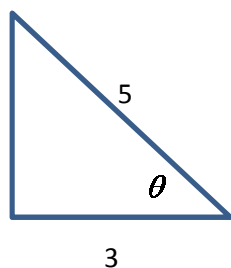


Practice Problems for VPT Calculus Part II

Calculate the period of the following trigonometric functions.

1. $y = \sin \theta, y = \cos \theta, y = \tan \theta, y = \csc \theta, y = \sec \theta, y = \cot \theta$
2. $y = 2 \cos 3\theta, y = 3 \sin 4\theta$
3. Given the following right triangle, find the exact value of the following trigonometric functions.



$$y = \sin \theta, y = \cos \theta, y = \tan \theta, y = \csc \theta, y = \sec \theta, y = \cot \theta$$

4. Given $P = \left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$ is a point on the unit circle that corresponds to θ , find the exact value of the following trigonometric functions.

$$y = \sin \theta, y = \cos \theta, y = \tan \theta, y = \csc \theta, y = \sec \theta, y = \cot \theta$$

5. Given $P = \left(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$ is a point on the unit circle that corresponds to θ , find the exact value of the following trigonometric functions.

$$y = \sin \theta, y = \cos \theta, y = \tan \theta, y = \csc \theta, y = \sec \theta, y = \cot \theta$$

Use Pythagorean Identities to simplify the following.

6. $\cos^2 \theta(1 + \tan^2 \theta)$
7. $\sin u \csc u - \cos^2 u$

Write the following using only sines and cosines.

8. $\frac{\cot \theta}{\csc \theta}$

9. $\tan \theta \csc \theta$

10. $\cot \theta \sec \theta$

Solve the following equations on $[0, 2\pi]$

11. $\tan \theta + 1 = 0$

12. $2 \sin \theta + 1 = 0$

13. Graph $y = 2 \cos 3x$

14. Graph $y = 3 \sin(4x - 8)$

15. Simplify $\frac{1 + \tan \theta}{1 + \cot \theta}$

16. Simplify $\frac{\tan \theta + \cot \theta}{\sec \theta \csc \theta}$

17. A 22-foot extension ladder leaning against a building makes a 70° angle with the ground. How far up the building does the ladder touch?

Find the exact value of the following.

18. $\sin\left(\tan^{-1}\left(\frac{1}{2}\right)\right)$

19. $\tan\left(\cos^{-1}\left(-\frac{1}{3}\right)\right)$

20. Determine the domain and range of $y = \sin \theta$, $y = \cos \theta$, $y = \tan \theta$

Answers to Practice Problems for VPT Calculus Part II

$$y = \sin \theta: 2\pi$$

$$y = \cos \theta: 2\pi$$

1. $y = \tan \theta: \pi$

$$y = \csc \theta: 2\pi$$

$$y = \sec \theta: 2\pi$$

$$y = \cot \theta: \pi$$

2. $y = 2 \cos 3\theta: \frac{2\pi}{3}$

$$y = 3 \sin 4\theta: \frac{\pi}{2}$$

$$\sin \theta = \frac{4}{5}$$

$$\cos \theta = \frac{3}{5}$$

$$\tan \theta = \frac{4}{3}$$

3. $\csc \theta = \frac{5}{4}$

$$\sec \theta = \frac{5}{3}$$

$$\cot \theta = \frac{3}{4}$$

$$\sin \theta = \frac{\sqrt{3}}{2}$$

$$\cos \theta = -\frac{1}{2}$$

$$\tan \theta = -\sqrt{3}$$

4. $\csc \theta = \frac{2\sqrt{3}}{3}$

$$\sec \theta = -2$$

$$\cot \theta = -\frac{\sqrt{3}}{3}$$

$$\sin \theta = -\frac{\sqrt{2}}{2}$$

$$\cos \theta = -\frac{\sqrt{2}}{2}$$

5. $\tan \theta = 1$

$$\csc \theta = -\sqrt{2}$$

$$\sec \theta = -\sqrt{2}$$

$$\cot \theta = 1$$

6. 1

7. $\sin^2 \theta$

8. $\cos \theta$

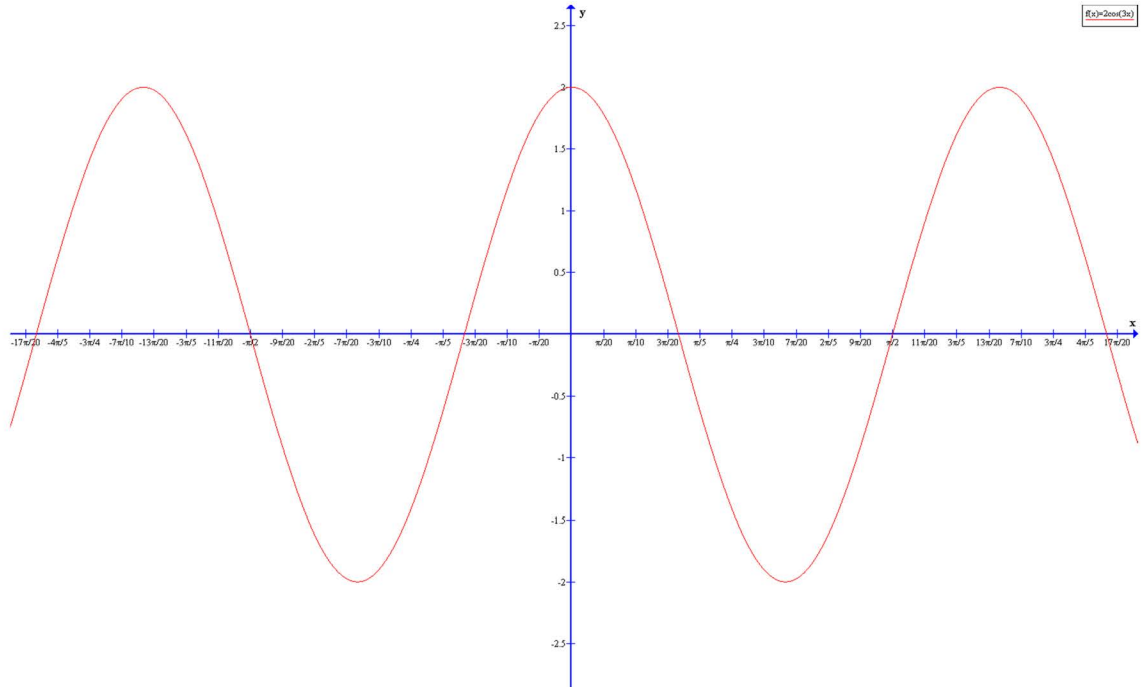
9. $\frac{1}{\cos \theta}$

10. $\frac{1}{\sin \theta}$

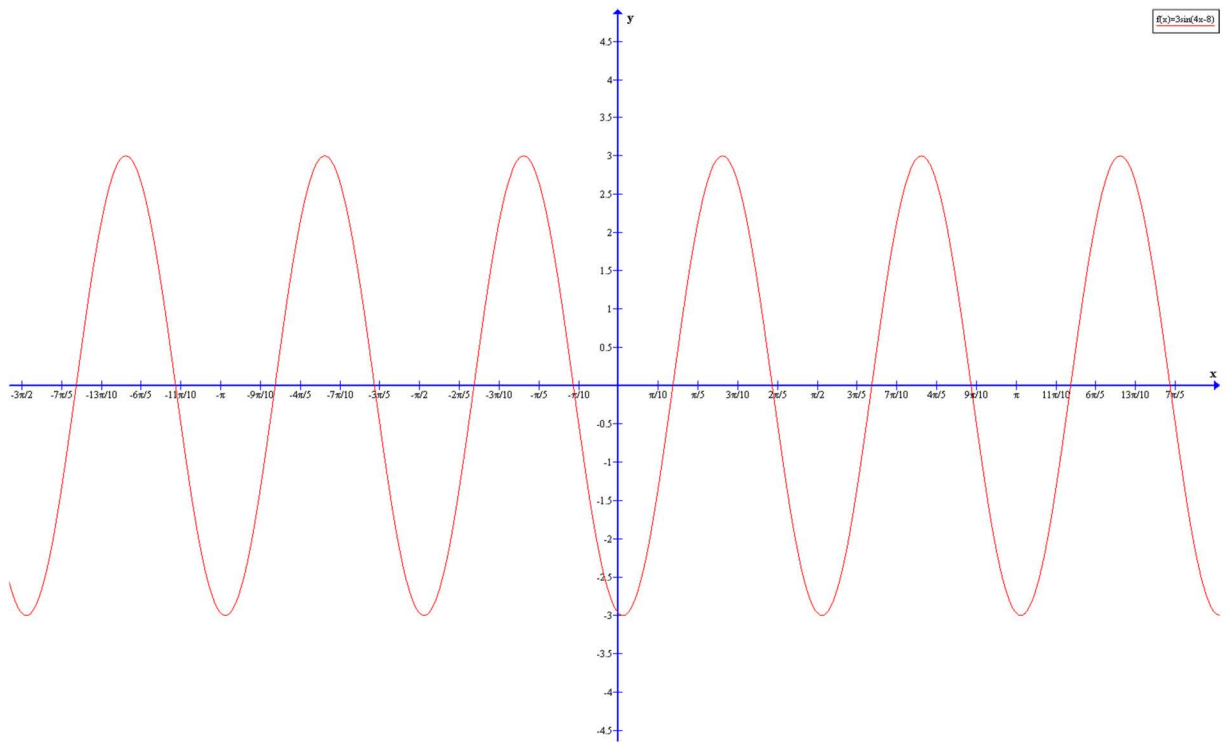
11. $\theta = \frac{3\pi}{4}, \frac{7\pi}{4}$

12. $\theta = \frac{7\pi}{6}, \frac{11\pi}{6}$

13.



14.



15. $\tan \theta$

16. 1

17. 20.67 feet

18. $\frac{\sqrt{5}}{5}$

19. $-2\sqrt{2}$

$y = \sin \theta$ D= $(-\infty, \infty)$ R= $[-1, 1]$

$y = \cos \theta$ D= $(-\infty, \infty)$ R= $[-1, 1]$

20.

$y = \tan \theta$ D=All real numbers except odd multiples of $\frac{\pi}{2}$ R= $(-\infty, \infty)$