Precalculus Review #1 Unit 4 page 1 _____

You may not use your calculator on this page.

Convert each radian measure to degree measure.

1. $\frac{\pi}{12}$ = _____

2. $\frac{5\pi}{4}$ = _____

3. $\frac{2\pi}{3}$ = _____

4. $\frac{-5\pi}{6}$ = _____

Convert each degree measure to radian measure (in terms of π).

5. 270° =

6. 75° =

7. 108° =

8. -15° =

In each of the following problems you are given a point on the terminal side of angle θ. (Assume that θ is in standard position.) Find the exact value of all six trigonometric functions. Express your answers in simplest form.

9. (5, -12)

sin θ = **sec** θ = **tan** θ =

cos θ = **csc** θ = **cot** θ =

10. (-2, -3)

sin θ = **sec** θ = **tan** θ =

cos θ = **csc** θ = **cot** θ =

Precalculus Review #1 Unit 4 page 2

You may not use your calculator on this page.

Find two values of θ between 0^o and 360^o that are solutions of each of the following equations. Express your solutions in degrees.

11. $\sin\theta = -0.5$

12. $\tan\theta = 1$

Find two values of x in the interval $[0, 2\pi)$ that are solutions of each of the following equations. Express your solutions in radians in terms of π.

13. $\sec x = 2$

14. $\sin x = 0$

Find the exact value of each of the following. Express your answers in simplest form.

15. $\sin 270° =$

16. $\sec -30° =$

17. $\tan 120° =$

18. $\cos 45° =$

19. $\csc 60° =$

20. $\cot 315° =$

21. $\cos 300° =$

22. $\sin -120° =$

23. $\csc -135° =$

24. $\sin \frac{5\pi}{4} =$

25. $\sec \frac{5\pi}{3} =$

26. $\tan \frac{\pi}{6} =$

27. $\cos \frac{-\pi}{4} =$

28. $\csc \frac{7\pi}{6} =$

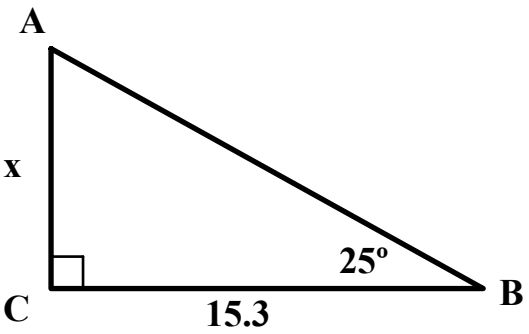
29. $\cot \frac{2\pi}{3} =$

Precalculus Review #1 Unit 4 page 3

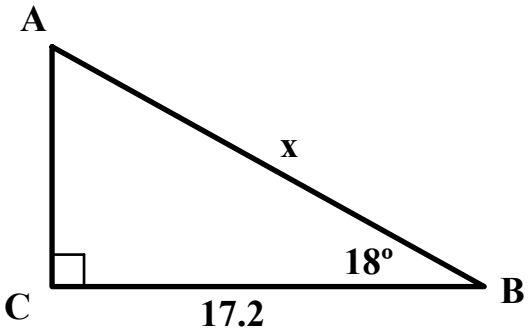
You will need to use your calculator on this page.

Find the value of x in each of the following diagrams. Show the equation you use and round your solution to 3 significant digits. The diagrams are not drawn to scale.

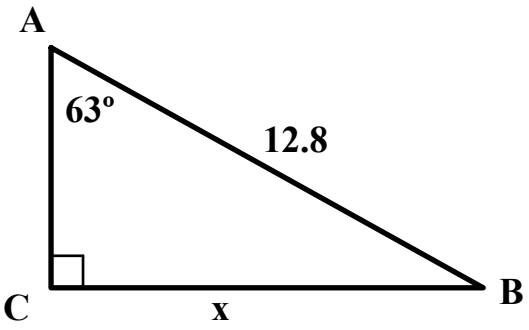
30. $x \approx$ _____



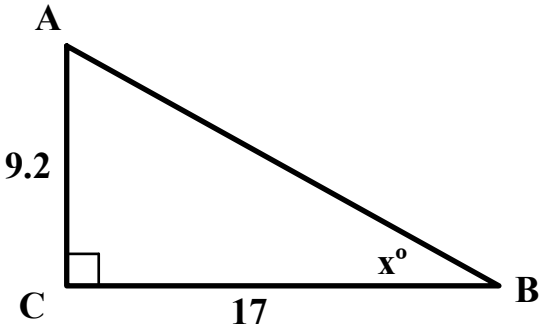
31. $x \approx$ _____



32. $x \approx$ _____



33. $x \approx$ _____



Find two values of θ between 0° and 360° that are solutions of each of the following equations. Express your solutions in degrees rounded to 3 significant digits.

34. $\cos \theta = -0.23$

35. $\csc \theta = 5.1$

Precalculus Review #1 Unit 4 page 4

You will need to use your calculator on this page.

Find two values of x between 0 and 2π that are solutions of each of the following equations. Express your solutions in radians rounded to 3 significant digits.

36. $\tan x = 6.1$

37. $\sin x = -0.85$

Solve each of the following problems. Express solutions rounded to 3 significant figures.

38. The second hand of a kitchen clock is 4 inches long. How fast is the tip of the second hand moving? Express your answer in inches per second.

39. A bicycle has tires that are 28 inches in diameter. If the bike is moving at 8 miles per hour, then what is the angular speed of the tires? Express your answer in degrees per second.

40. A circular saw blade with a radius of 7 inches is turning at 1500 revolutions per minute. How fast are the teeth of the blade moving? Express your answer in feet per second.

41. The latitude of city A is 53° 15' N, and the latitude of city B is 24° 18' N. If city A is due north of city B, then what is the distance between them? Assume that the earth is a sphere with a radius of 4000 miles.