

Trigonometry Review #1

Angles, Exact values

If each angle has the given measure and is in standard position, determine the quadrant in which its terminal side lies.

1. $\frac{7\pi}{12}$ II

2. $-\frac{2\pi}{3}$ III

3. 371° I

4. $\frac{14\pi}{5}$ II

5. -156°
III

6. 1000°
IV

7. 332°
IV

8. -240°
II

Change each degree measure to radian measure in terms of π .

9. 36° $\frac{\pi}{5}$

10. -250° $-\frac{25\pi}{18}$

11. -145° $-\frac{29\pi}{36}$

12. 6° $\frac{\pi}{30}$

13. 870° $\frac{29\pi}{6}$

14. 18° $\frac{\pi}{10}$

15. -820° $-\frac{41\pi}{9}$

16. 345° $\frac{23\pi}{12}$

Change each radian measure to degree measure.

17. -1 $-\frac{180^\circ}{\pi}$

18. 4π 720°

19. -2.56 $-\frac{460.8^\circ}{\pi}$

20. 12.85 $\frac{2313^\circ}{\pi}$

21. $\frac{3\pi}{16}$ $\frac{135^\circ}{4}$

22. $-\frac{7\pi}{9}$ -140°

23. $\frac{13\pi}{30}$ 78°

24. $-\frac{17\pi}{3}$ -1020°

Find one positive angle and one negative angle that are coterminal with each angle.

25. 70°
 $430^\circ, -290^\circ$

26. $-\frac{2\pi}{5}$
 $\frac{8\pi}{5}, -\frac{12\pi}{5}$

27. -300°
 $60^\circ, -660^\circ$

28. $\frac{3\pi}{4}$
 $\frac{11\pi}{4}, -\frac{5\pi}{4}$

Find the reference angle for each angle with the given measure.

29. -20° 20°

30. 160° 20°

31. -545° 5°

32. 300° 60°

33. $\frac{10\pi}{3}$ $\frac{\pi}{3}$

34. $-\frac{5\pi}{8}$ $\frac{\pi}{8}$

35. $-\frac{\pi}{4}$ $\frac{\pi}{4}$

36. $-\frac{7\pi}{3}$ $\frac{\pi}{3}$

Find each exact value. Do not use a calculator.

1. $\sin \frac{\pi}{4}$

$$\frac{\sqrt{2}}{2}$$

2. $\cos \frac{\pi}{4}$

$$\frac{\sqrt{2}}{2}$$

3. $\tan \frac{\pi}{4}$

$$1$$

4. $\cos 210^\circ$

$$-\frac{\sqrt{3}}{2}$$

5. $\sin 300^\circ$

$$-\frac{\sqrt{3}}{2}$$

6. $\tan 330^\circ$

$$-\frac{\sqrt{3}}{3}$$

7. $\sin \frac{3\pi}{4}$

$$\frac{\sqrt{2}}{2}$$

8. $\cos \frac{3\pi}{4}$

$$-\frac{\sqrt{2}}{2}$$

9. $\tan \frac{3\pi}{4}$

$$-1$$

10. $\sin 90^\circ$

$$1$$

11. $\csc 270^\circ$

$$-1$$

12. $\tan 45^\circ$

$$1$$

13. $\cos \frac{3\pi}{2}$

$$0$$

14. $\tan \frac{3\pi}{2}$

$$\text{undefined}$$

15. $\sin \frac{3\pi}{2}$

$$-1$$

Use a calculator to approximate each value to four decimal places.

16. $\cot (-75^\circ)$

$$-0.2679$$

17. $\sin 634^\circ$

$$-0.9976$$

18. $\cos 235^\circ$

$$-0.5736$$

19. $\sin 2$

$$0.9093$$

20. $\sec 4.28$

$$-2.3864$$

21. $\cot 0.23$

$$4.2709$$

Find each value by referring to the graphs of the trigonometric functions.

1. $\sin(-720^\circ)$

0

2. $\tan(-180^\circ)$

0

3. $\cos(540^\circ)$

-1

4. $\tan(180^\circ)$

0

5. $\csc(720^\circ)$

is undefined

6. $\sec(180^\circ)$

-1

Find the values of θ for which each equation is true.

7. $\sin \theta = -1$

$$\theta = \frac{3\pi}{2} + 2\pi n$$

8. $\sec \theta = -1$

$$\cos \theta = -1$$

$$\theta = \pi + 2\pi n$$

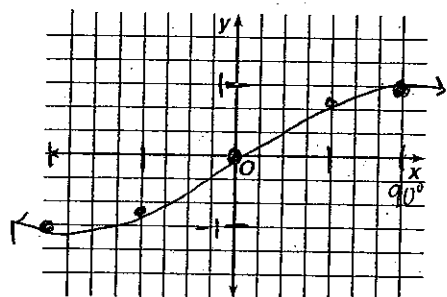
$$\text{or } (2n+1)\pi$$

9. $\tan \theta = 0$

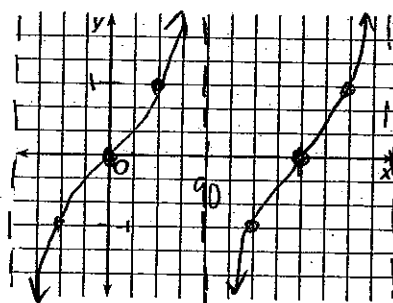
$$\theta = \pi n$$

Graph each function on the given interval.

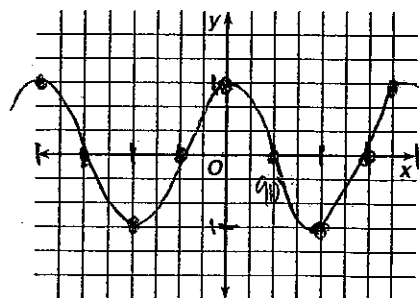
10. $y = \sin x; -90^\circ \leq x \leq 90^\circ$



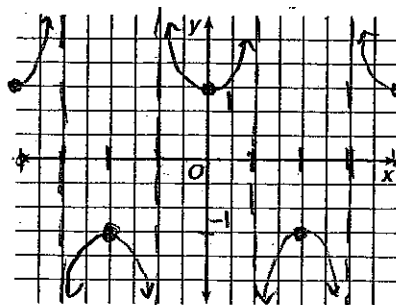
11. $y = \tan x; -90^\circ \leq x \leq 270^\circ$



12. $y = \cos x; -360^\circ \leq x \leq 360^\circ$



13. $y = \sec x; -360^\circ \leq x \leq 360^\circ$



State the amplitude, period, and phase shift for each function.

1. $y = -2 \sin \theta$

amp = 2 P.S. = 0
period = 2π

2. $y = 10 \sec \theta$

amp: none
per = 2π
P.S. = 0

3. $y = -3 \sin 4\theta$

amp = 3
per = $\pi/2$
P.S. = 0

4. $y = 0.5 \sin(\theta - \frac{\pi}{3})$

amp = 0.5
per = 2π
P.S. = $\frac{\pi}{3}$

5. $y = 2.5 \cos(\theta + 180^\circ)$

amp = 2.5
per = 360°
P.S. = -180°

6. $y = -1.5 \sin(4\theta - \frac{\pi}{4})$
 $y = -1.5 \sin 4(\theta - \frac{\pi}{16})$

amp = 1.5
per = $\pi/2$
P.S. = $\pi/16$

Write an equation of the sine function with each amplitude, period, and phase shift.

7. amplitude = 0.75, period = 360° , phase shift = 30°

$y = 0.75 \sin(x - 30^\circ)$

8. amplitude = 4, period = 3° , phase shift = -30°

$y = 4 \sin 120(x + 30^\circ)$
 $y = 4 \sin(120x + 3600^\circ)$

$\frac{360^\circ}{b} = 3^\circ$
 $b = 120^\circ$

Write an equation of the cosine function with each amplitude, period, and phase shift.

9. amplitude = 3.75, period = 90° , phase shift = 4°

$y = 3.75 \cos 4^\circ(x - 4^\circ)$
 $y = 3.75 \cos(4x - 16^\circ)$

$\frac{360^\circ}{b} = 90^\circ$

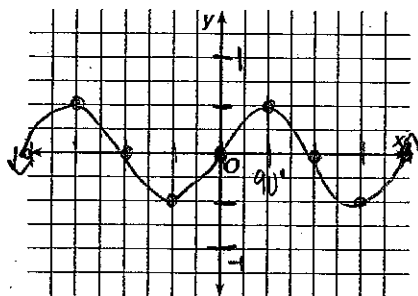
10. amplitude = 12, period = 45° , phase shift = 180°

$y = 12 \cos 8(x - 180^\circ)$
 $y = 12 \cos(8x - 1440^\circ)$

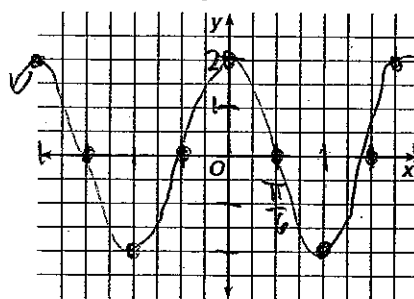
$\frac{360^\circ}{b} = 45^\circ$
 $b = 8$

Graph each function.

11. $y = 0.5 \sin x$



12. $y = 2 \cos(3x)$

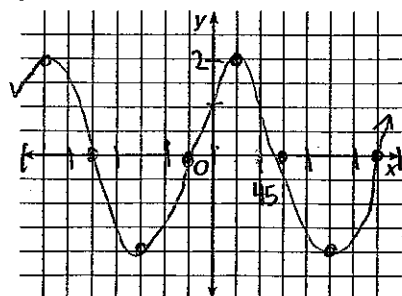


per = $\frac{2\pi}{3}$

amp = 2

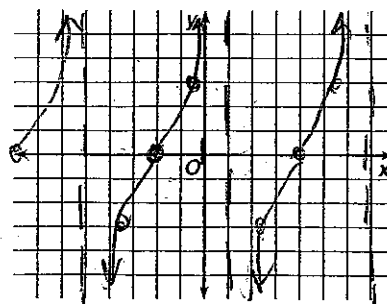
IV = $\frac{2\pi}{12} = \frac{\pi}{6}$

13. $y = 2 \cos(2x - 45^\circ) = 2 \cos 2(x - 22.5^\circ)$



period = 180°
amp = 2
IV = 45°

14. $y = \tan(x + 60^\circ)$



Calculus
Trigonometry Review #3
Identities

Name _____

Solve for values of θ between 0° and 90° .

1. If $\tan \theta = 2$, find $\cot \theta$.

$$\cot \theta = \frac{1}{2}$$

2. If $\sin \theta = \frac{2}{3}$, find $\cos \theta$.

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

3. If $\cos \theta = \frac{1}{4}$, find $\tan \theta$

$$\tan \theta = \sqrt{15}$$

4. If $\tan \theta = 3$, find $\sec \theta$.

$$\sec \theta = \sqrt{10}$$

5. If $\sin \theta = \frac{7}{10}$, find $\cot \theta$.

$$\cot \theta = \frac{\sqrt{51}}{7}$$

6. If $\tan \theta = \frac{7}{2}$, find $\sin \theta$.

$$\sin \theta = \frac{7}{\sqrt{53}}$$

Simplify.

7. $\frac{\cot A}{\tan A}$

$$\cot^2 A$$

8. $\frac{\sin^2 \beta \cot \beta}{\cos \beta}$

$$\sin \beta$$

9. $\sin^2 \theta \cos^2 \theta - \cos^2 \theta$

$$-\cos^4 \theta$$

Use the sum and difference identities to find the exact value of each function.

10. $\cos 75^\circ$

$$\frac{\sqrt{6} - \sqrt{2}}{4}$$

11. $\sin(-165^\circ)$

$$\frac{-\sqrt{6} + \sqrt{2}}{4}$$

Verify that each of the following is an identity.

$$12. \frac{\csc x}{\cot x + \tan x} = \cos x$$

$$13. \tan u + \frac{\cos u}{1 + \sin u} = \sec u$$

$$14. 1 - 2 \sin^2 r + \sin^4 r = \cos^4 r$$

$$15. \cos(180^\circ - \theta) = -\cos \theta$$

If $\sin A = \frac{12}{13}$ and A is in the first quadrant, find each value.

16. $\cos 2A$

$$\frac{-119}{169}$$

17. $\sin 2A$

$$\frac{120}{169}$$

18. $\tan 2A$

$$\frac{-120}{119}$$

Calculus
Trigonometry Review #4
Solving Equations

Name _____

Solve each equation for all values of x .

1. $2 \sin^2 x - 5 \sin x + 2 = 0$

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

2. $\sin^2 x - 2 \sin x - 3 = 0$

$$x = \frac{3\pi}{2} + 2\pi n$$

3. $3 \cos 2x - 5 \cos x = 1$

$$x = \frac{2\pi}{3} + 2\pi n$$
$$x = \frac{4\pi}{3} + 2\pi n$$

4. $2 \tan x \cos x + 2 \cos x = \tan x + 1$

$$x = \frac{\pi}{3} + 2\pi n$$
$$x = \frac{5\pi}{3} + 2\pi n$$
$$x = \frac{3\pi}{4} + \pi n$$

Solve each equation for $0^\circ \leq x \leq 180^\circ$.

5. $2 \sin^2 x - 1 = 0$

$$x = 45^\circ, 135^\circ$$

6. $\cos x = 3 \cos x - 2$

$$x = 0^\circ$$

7. $\tan x = \sin x$

$$x = 0^\circ, 180^\circ$$

8. $\cos x \sin 2x = 0$

$$x = 0^\circ, 90^\circ, 180^\circ$$

9. $\sec x = 1 + \tan x$

$$x = 0^\circ$$

10. $4 \sin^2 x - 4 \sin x + 1 = 0$

$$x = 30^\circ \text{ and } 150^\circ$$

11. $\sin 2x = 2 \cos x$

$$x = 90^\circ$$

12. $\tan^2 x + \tan x = 0$

$$x = 0^\circ, 135^\circ, 180^\circ$$

13. $2 \sin 2x = 1$

$$x = 15^\circ, 75^\circ$$

14. $\cos 2x + \sin x = 1$

$$x = 0^\circ, 30^\circ, 150^\circ, 180^\circ$$