

# 9.2 Reference Triangles

## NOTES

### ALGEBRA 2

Write your questions here!

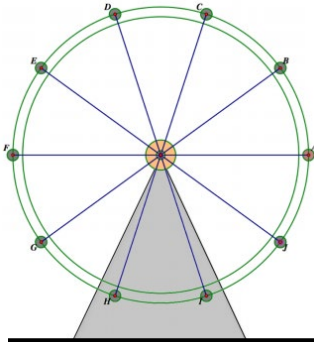


$\sin 30^\circ$

$\sin 150^\circ$

$\sin 210^\circ$

$\sin 330^\circ$



### Reference Angles – how far from the x-axis

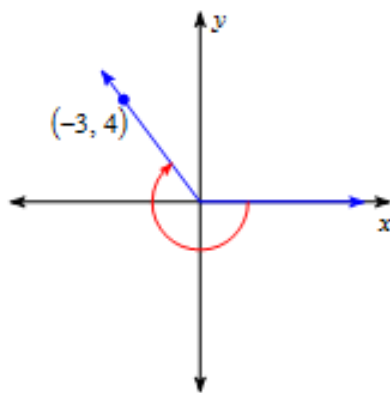
$160^\circ$

$240^\circ$

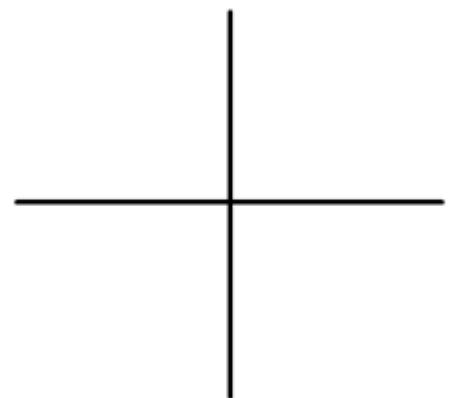
$310^\circ$

$-160^\circ$

### Reference Triangles –



Find  $\sin \theta$



Find  $\cos \theta$

Given  $\theta$  is in Quadrant IV and  $\sin \theta = -\frac{5}{13}$ , then find  $\cos \theta$ .

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Given  $90^\circ \leq \theta \leq 180^\circ$  and  $\sin \theta = \frac{8}{17}$ , then find  $\tan \theta$ .

**SUMMARY:**

Now,  
summarize  
your notes  
here!



**Find the reference angle.**

1.  $150^\circ$

2.  $210^\circ$

3.  $-120^\circ$

4.  $320^\circ$

5.  $135^\circ$

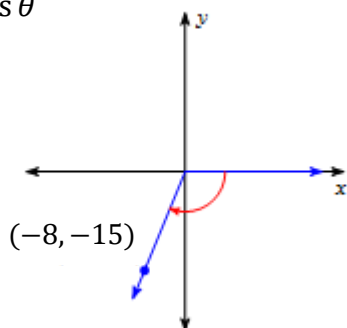
6.  $-200^\circ$

7.  $100^\circ$

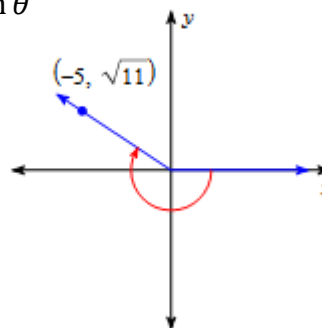
8.  $290^\circ$

**Use the given point on the terminal side of the angle  $\theta$  to find the trigonometric function indicated.**

9.

 $\cos \theta$ 

10.

 $\sin \theta$ 

**Draw the reference triangle. Find the EXACT value of the trig ratio for  $\theta$ .**

11.  $\sin \theta$  for  $(6, 8)$

12.  $\cos \theta$  for  $(\sqrt{3}, -1)$

13.  $\cos \theta$  for  $(-3, -4)$

14.  $\sin \theta$  for  $(-12, 5)$

**Draw the reference triangle. Find the EXACT value of the trig ratio for  $\theta$ .**

15. Given  $\tan \theta = \frac{12}{5}$  in quadrant III.  
Find  $\sin \theta$

16. Given  $\cos \theta = -\frac{4}{5}$  where  $90^\circ < \theta < 180^\circ$ .  
Find  $\tan \theta$

17. Given  $\tan \theta = -\frac{15}{8}$  where  $270^\circ < \theta < 360^\circ$   
Find  $\cos \theta$

18. Given  $\cos \theta = -\frac{\sqrt{5}}{3}$  in quadrant II  
Find  $\sin \theta$

19. Given  $\tan \theta = 3$  where  $180^\circ < \theta < 270^\circ$   
Find  $\cos \theta$

20. Given  $\sin \theta = \frac{3}{5}$  in quadrant II  
Find  $\tan \theta$

**Solve the following.**

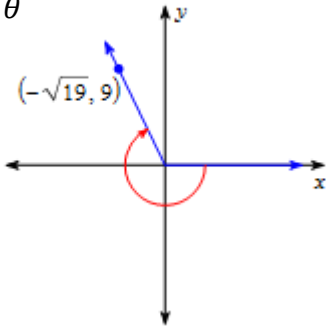
27.  $x^2 - 3x + 20 = 9x$

28.  $20 = 3(b)^5$

29.  $20 = 5(2)^t$

1. Use the given point on the terminal side of the angle  $\theta$  to find the trigonometric function indicated.

$\cos \theta$



2. Draw the reference triangle. Find the EXACT value of the trig ratio for  $\theta$ .

$\sin \theta$  for  $(10, -24)$

3. Angle  $\theta$  is in Quadrant II, and  $\sin \theta = \frac{4}{5}$ . What is the value of  $\cos \theta$ ?

A.  $\frac{4}{5}$

B.  $\frac{3}{5}$

C.  $-\frac{3}{5}$

D.  $-\frac{4}{5}$

4. Suppose that  $\theta$  is a second quadrant angle and that  $\cos \theta = -\frac{4}{5}$ . What is the value of  $\sin \theta$  to the nearest tenth?

Enter your answer in the box.

5. When the angle  $\theta$  is in standard position in the  $xy$ -coordinate plane, the terminal side of the angle lies in Quadrant I. If  $\sin \theta = \frac{3}{5}$ , what is  $\tan \theta$ ?

Express your answer as a fraction.