

Date: _____

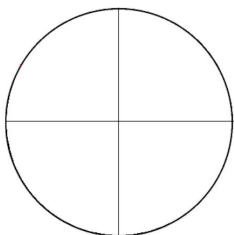
Name: _____

PRACTICE Exact Values

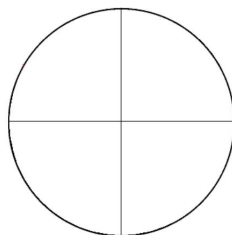
For each of the following

- Draw the angle given in standard position
- Find the related acute angle
- Draw and label the special triangle
- Use the triangle to state the trig ratios (primary on the left column, secondary on the right column)

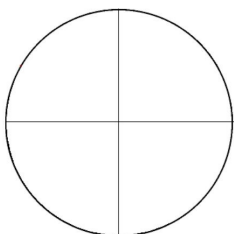
1. 135°



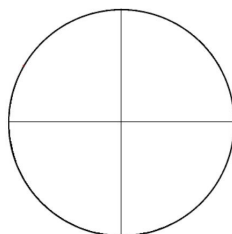
2. 240°



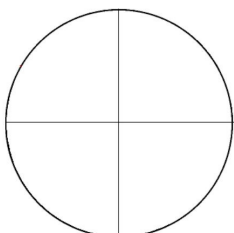
3. 30°



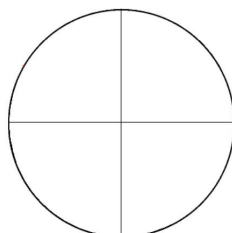
4. 300°



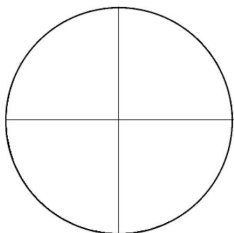
5. 225°



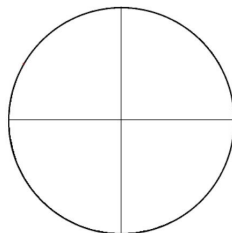
6. 120°



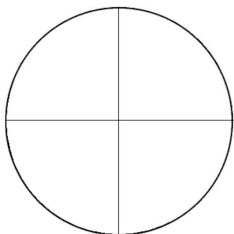
7. 330°



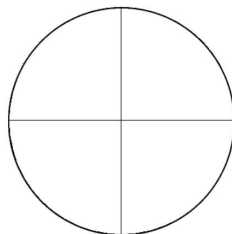
8. 210°



9. -45°



10. 270°



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PRACTICE Solving for the Angles

For each of the following

- Draw the terminal arms in the correct quadrants
- Find all answers for the angles within first positive revolution

11. $\sin \theta = -\frac{\sqrt{3}}{2}$

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

13. $\tan \theta = -1$

14. $\tan \theta = \frac{\sqrt{3}}{3}$

15. $\sin \theta = \frac{1}{2}$

16. $\cos \theta = -\frac{\sqrt{3}}{2}$

17. $\cos \theta = 0$

18. $\sin \theta = -1$

19. $\tan \theta = 0$

20. $\cos \theta = -1$

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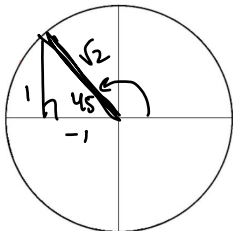
Name: ANSWERS**PRACTICE Drawing Angles in Radians and Exact Values**

For each of the following

- Draw the angle given in standard position
- Find the related acute angle
- Draw and label the special triangle
- Use the triangle to state the trig ratios (primary on the left column, secondary on the right column)

1. $\frac{3\pi}{4} = 135^\circ$

related acute = 45°



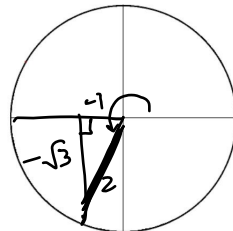
$$\sin 135^\circ = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$\cos 135^\circ = \frac{-1}{\sqrt{2}} = -\frac{\sqrt{2}}{2}$$

$$\tan 135^\circ = -1$$

2. $\frac{4\pi}{3} = 240^\circ$

related acute = 60°



$$\csc 240^\circ = \frac{-2}{\sqrt{3}} = -\frac{2\sqrt{3}}{3}$$

$$\sec 240^\circ = -2$$

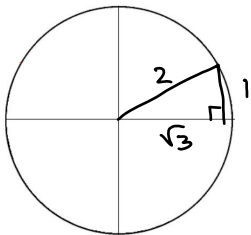
$$\cot 240^\circ = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

3. $\frac{\pi}{6} = 30^\circ$

$\sin 30^\circ = \frac{1}{2}$

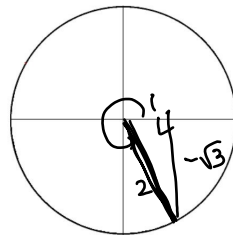
$\cos 30^\circ = \frac{\sqrt{3}}{2}$

$\tan 30^\circ = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$



4. $\frac{5\pi}{3} = 300^\circ$

related acute = 60°



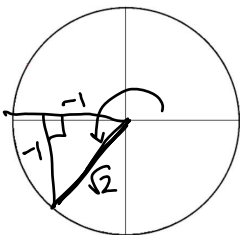
$$\csc 300^\circ = \frac{2}{-\sqrt{3}} = -\frac{2\sqrt{3}}{3}$$

$$\sec 300^\circ = 2$$

$$\cot 300^\circ = \frac{1}{-\sqrt{3}} = -\frac{\sqrt{3}}{3}$$

5. $\frac{5\pi}{4} = 225^\circ$

related acute = 45°



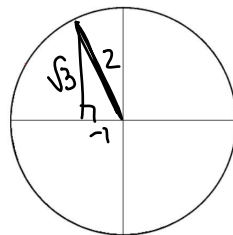
$$\sin 225^\circ = \frac{-1}{\sqrt{2}} = -\frac{\sqrt{2}}{2}$$

$$\cos 225^\circ = \frac{-1}{\sqrt{2}} = -\frac{\sqrt{2}}{2}$$

$$\tan 225^\circ = \frac{-1}{-1} = 1$$

6. $\frac{2\pi}{3} = 120^\circ$

related acute = 60°



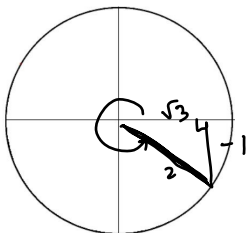
$$\csc 120^\circ = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$$

$$\sec 120^\circ = -2$$

$$\cot 120^\circ = \frac{-1}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$$

7. $\frac{11\pi}{6} = 330^\circ$

related acute = 30°



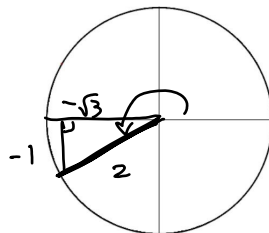
$$\sin 330^\circ = -\frac{1}{2}$$

$$\cos 330^\circ = \frac{\sqrt{3}}{2}$$

$$\tan 330^\circ = \frac{-1}{\sqrt{3}}$$

8. $\frac{7\pi}{6} = 210^\circ$

related acute = 30°



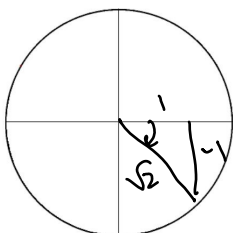
$$\csc 210^\circ = -2$$

$$\sec 210^\circ = \frac{2}{-\sqrt{3}} = -\frac{2\sqrt{3}}{3}$$

$$\cot 210^\circ = \frac{-\sqrt{3}}{-1} = \sqrt{3}$$

9. $-\frac{\pi}{4} = -45^\circ$

related acute = 45°



$$\sin(-45^\circ) = \frac{-1}{\sqrt{2}} = -\frac{\sqrt{2}}{2}$$

$$\cos(-45^\circ) = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

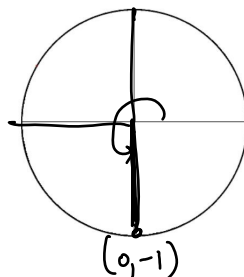
$$\tan(-45^\circ) = \frac{-1}{1} = -1$$

10. $\frac{3\pi}{2} = 270^\circ$

$\csc 270^\circ = \frac{r}{y} = \frac{1}{-1} = -1$

$\sec 270^\circ = \frac{r}{x} = \frac{1}{0} = \text{undefined}$

$\cot 270^\circ = \frac{x}{y} = \frac{0}{-1} = 0$



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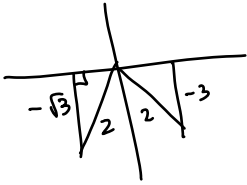
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PRACTICE Solving for the Angles

For each of the following

- Draw the terminal arms in the correct quadrants
- Find all answers for the angle in radians within first positive revolution (exact angles if possible)

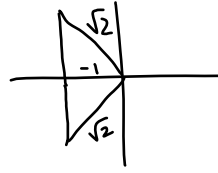
11. $\sin \theta = -\frac{\sqrt{3}}{2}$ related to 60° angle



$\therefore \theta_1 = 240^\circ$

$\theta_2 = 300^\circ$

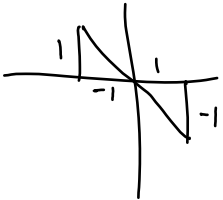
12. $\cos \theta = -\frac{\sqrt{2}}{2} = -\frac{1}{\sqrt{2}}$ related to 45° angle



$\therefore \theta_1 = 135^\circ$

$\theta_2 = 225^\circ$

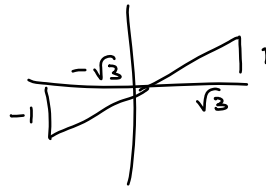
13. $\tan \theta = -\frac{1}{1} \frac{y}{x} \text{ or } \frac{1}{-1}$ related to 45°



$\theta_1 = 135^\circ$

$\theta_2 = 315^\circ$

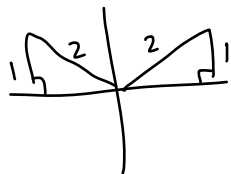
14. $\tan \theta = \frac{\sqrt{3}}{3} = \frac{1}{\sqrt{3}} \frac{y}{x} \text{ or } \frac{-1}{-\sqrt{3}}$ related to 30° angle



$\theta_1 = 30^\circ$

$\theta_2 = 210^\circ$

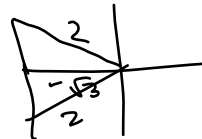
15. $\sin \theta = \frac{1}{2} \frac{y}{r}$ related to 30° angle



$\therefore \theta_1 = 30^\circ$

$\theta_2 = 150^\circ$

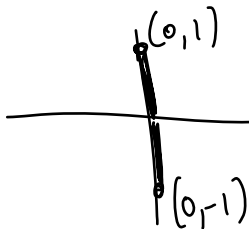
16. $\cos \theta = -\frac{\sqrt{3}}{2} = \frac{x}{r}$ related to 30° angle



$\theta_1 = 150^\circ$

$\theta_2 = 210^\circ$

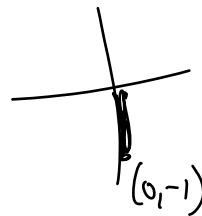
17. $\cos \theta = 0 = x$



$\theta_1 = 90^\circ$

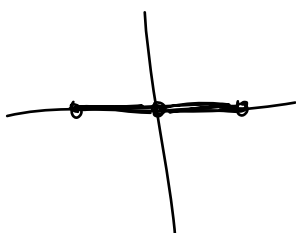
$\theta_2 = 270^\circ$

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



$\theta = 270^\circ$ only

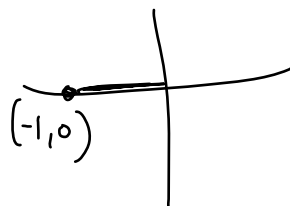
19. $\tan \theta = 0$ slope



$\theta_1 = 0^\circ$
 $\theta_2 = 180^\circ$
 $\theta_3 = 360^\circ$

← same

20. $\cos \theta = -1 = x$



$\theta = 180^\circ$ only