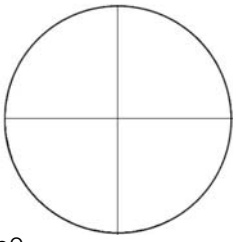
Date: _____ Name: _____

PRACTICE Exact Values

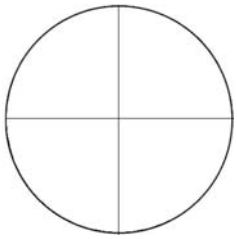
For each of the following

- 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)

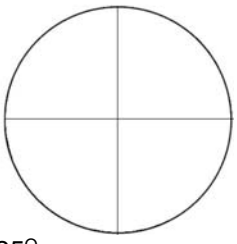
1. $\frac{3\pi}{4}$ or 135^{O} since pi=180^{o}



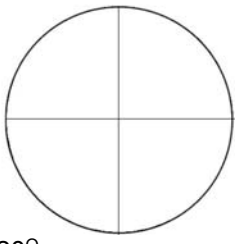
2. 240^{O}



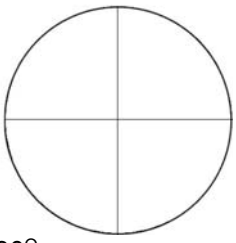
3. 30^{O}



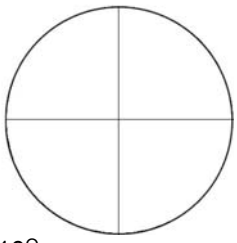
4. 300^{O}



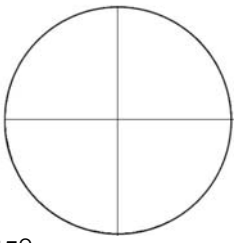
5. 225^{O}



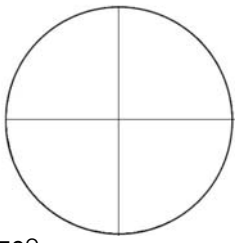
6. 120^{O}



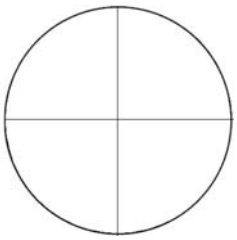
7. 330^{O}



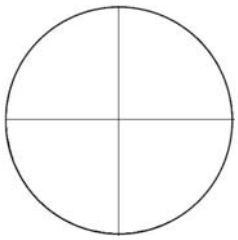
8. 210^{O}



9. -45^{O}



10. 270^{O}



Date: _____ Name: _____

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. $\cos\theta = -1$

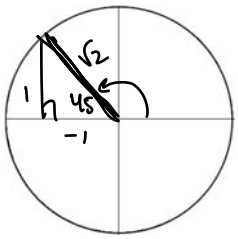
Date: _____ Name: ANSWERS

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 $= 45^\circ$

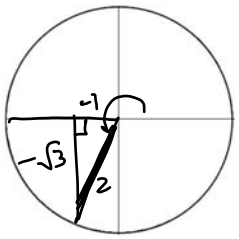


$\sin 135^\circ = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

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

$\tan 135^\circ = -1$

2. $\frac{4\pi}{3} = 240^\circ$ related acute $= 60^\circ$

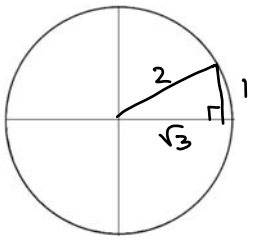


$\csc 240^\circ = \frac{-2}{\sqrt{3}} = -\frac{2\sqrt{3}}{3}$

$\sec 240^\circ = -2$

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

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

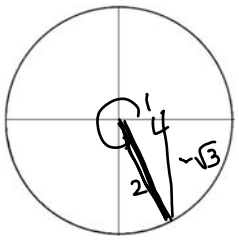


$\sin 30^\circ = \frac{1}{2}$

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

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

4. $\frac{5\pi}{3} = 300^\circ$ related acute $= 60^\circ$

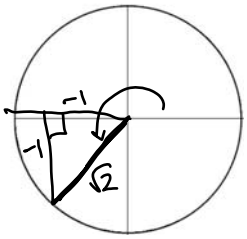


$\csc 300^\circ = \frac{2}{-\sqrt{3}} = -\frac{2\sqrt{3}}{3}$

$\sec 300^\circ = 2$

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

5. $\frac{5\pi}{4} = 225^\circ$ related acute $= 45^\circ$

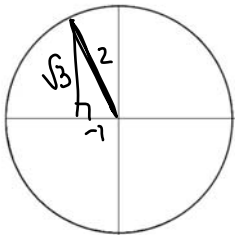


$\sin 225^\circ = \frac{-1}{\sqrt{2}} = -\frac{\sqrt{2}}{2}$

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

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

6. $\frac{2\pi}{3} = 120^\circ$ related acute $= 60^\circ$

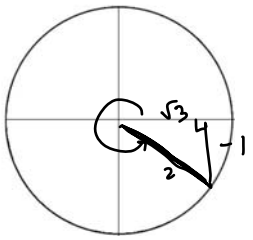


$\csc 120^\circ = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$

$\sec 120^\circ = -2$

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

7. $\frac{11\pi}{6} = 330^\circ$ related acute $= 30^\circ$

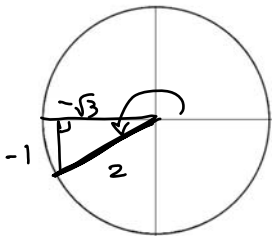


$\sin 330^\circ = \frac{-1}{2}$

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

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

8. $\frac{7\pi}{6} = 210^\circ$ related acute $= 30^\circ$

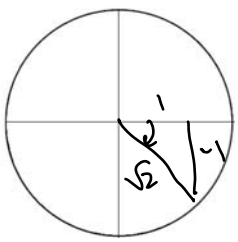


$\csc 210^\circ = -2$

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

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

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

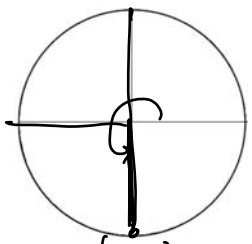


$\sin(-45^\circ) = \frac{-1}{\sqrt{2}} = -\frac{\sqrt{2}}{2}$

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

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

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



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

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

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

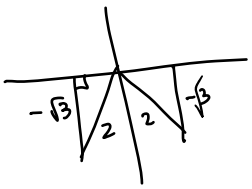
Date: _____ Name: _____

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)

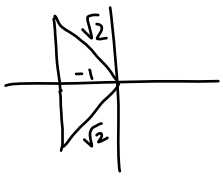
11. $\sin\theta = -\frac{\sqrt{3}}{2}$ related to 60° angle



$\therefore \theta_1 = 240°$

$\theta_2 = 300°$

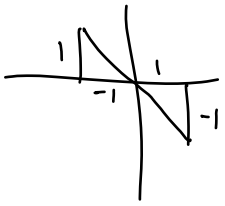
12. $\cos\theta = -\frac{\sqrt{2}}{2} = \frac{-1}{\sqrt{2}}$ related to 45° angle



$\therefore \theta_1 = 135°$

$\theta_2 = 225°$

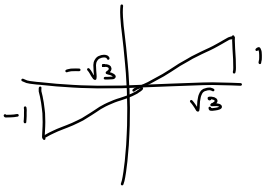
13. $\tan\theta = \frac{-1}{1}$ $\frac{y}{x}$ or $\frac{1}{-1}$ related to 45°



$\theta_1 = 135°$

$\theta_2 = 315°$

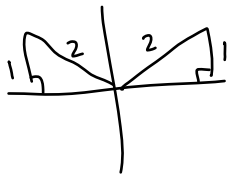
14. $\tan\theta = \frac{\sqrt{3}}{3} = \frac{1}{\sqrt{3}}$ $\frac{y}{x}$ or $\frac{-1}{-\sqrt{3}}$ related to 30° angle



$\theta_1 = 30°$

$\theta_2 = 210°$

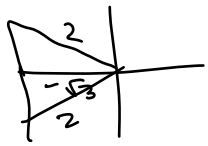
15. $\sin\theta = \frac{1}{2}$ $\frac{y}{r}$ related to 30° angle



$\therefore \theta_1 = 30°$

$\theta_2 = 150°$

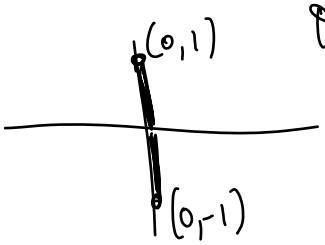
16. $\cos\theta = -\frac{\sqrt{3}}{2} = \frac{x}{r}$ related to 30° angle



$\theta_1 = 150°$

$\theta_2 = 210°$

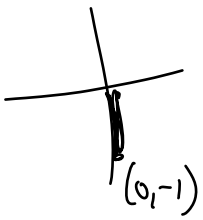
17. $\cos\theta = 0 = x$



$\theta_1 = 90°$

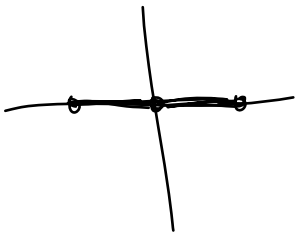
$\theta_2 = 270°$

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



$\theta = 270°$ only

19. $\tan\theta = 0$ slope

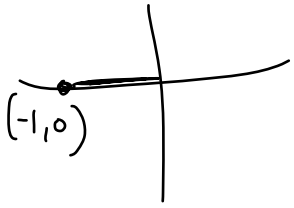


$\theta_1 = 0°$ ← same

$\theta_2 = 180°$

$\theta_3 = 360°$

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



$\theta = 180°$ only