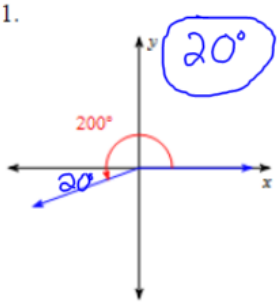
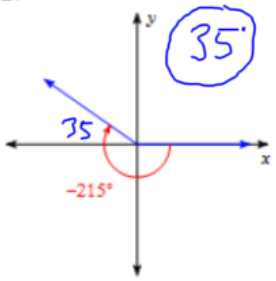
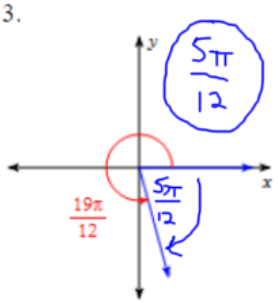
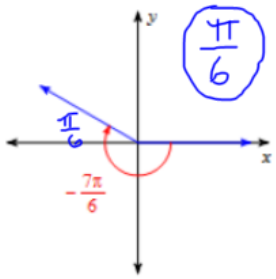
PRACTICE

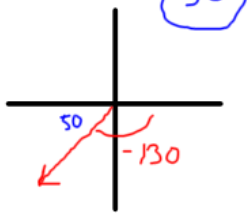
Find the reference angle.

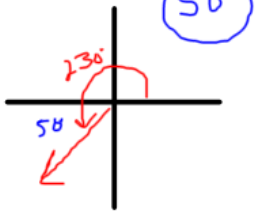
1. 

2. 

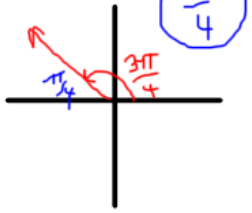
3. 

4. 

5. $-130°$ 

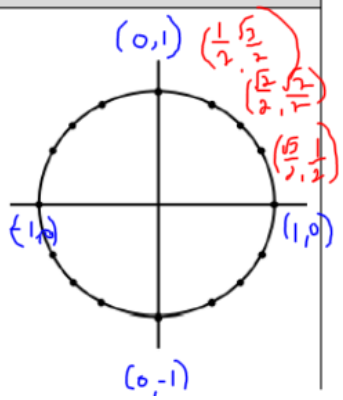
6. $230°$ 

7. $-\frac{13\pi}{9}$

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

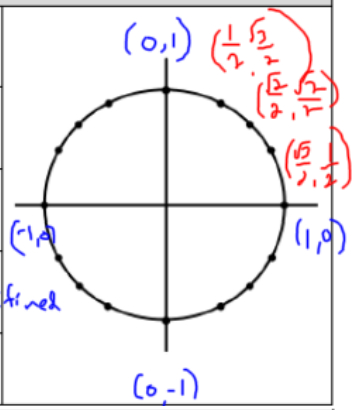
Find the exact value.

9. $\sin 90° = 1$	10. $\cos 120° = -\frac{1}{2}$	11. $\tan 45° = 1$
12. $\tan 120° = \frac{\sqrt{3}/2}{-1/2} = -\sqrt{3}$	13. $\cos 225° = -\frac{\sqrt{2}}{2}$	14. $\sin 135° = \frac{\sqrt{2}}{2}$
15. $\sin 330° = -\frac{1}{2}$	16. $\tan 315° = -1$	17. $\cos 240° = -\frac{1}{2}$
18. $\sin(-225°) = \frac{\sqrt{2}}{2}$	19. $\cos(-240°) = -\frac{1}{2}$	20. $\tan(-300°) = \frac{\sqrt{3}/2}{1/2} = \sqrt{3}$
21. $\sec(180°) = -1$	22. $\csc(-270°) = 1$	23. $\cot(-315°) = \frac{\sqrt{2}/2}{\sqrt{2}/2} = 1$



Find the exact value.

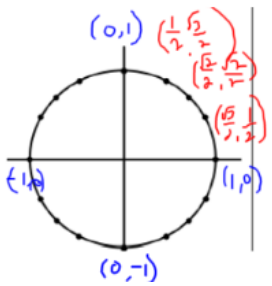
24. $\sin\frac{\pi}{2} = 1$	25. $\tan\frac{\pi}{4} = 1$	26. $\cos\frac{3\pi}{2} = 0$
27. $\cos\frac{4\pi}{3} = -\frac{1}{2}$	28. $\cos\frac{\pi}{6} = \frac{\sqrt{3}}{2}$	29. $\tan\pi = \frac{0}{-1} = 0$
30. $\sin\frac{5\pi}{4} = -\frac{\sqrt{2}}{2}$	31. $\cos\frac{5\pi}{3} = \frac{1}{2}$	32. $\sin\frac{5\pi}{6} = \frac{1}{2}$
33. $\tan\frac{7\pi}{4} = \frac{-\sqrt{2}/2}{\sqrt{2}/2} = -1$	34. $\sin(-\pi) = 0$	35. $\tan\left(-\frac{3\pi}{2}\right) = \frac{1}{0} =$ undefined
36. $\cos\left(-\frac{\pi}{3}\right) = \frac{1}{2}$	37. $\sec\left(-\frac{\pi}{2}\right) =$ undefined	38. $\sin\left(-\frac{5\pi}{4}\right) = \frac{\sqrt{2}}{2}$

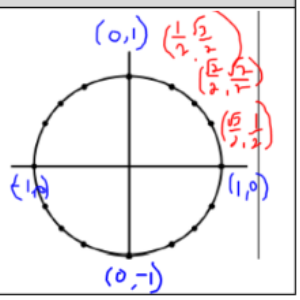


If $0° \le \theta \le 360°$, then find θ

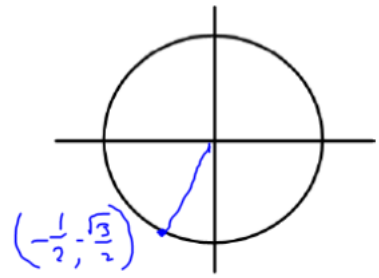
39. $\sin\theta = \frac{1}{2}$ $30°, 150°$	40. $\cos\theta = \frac{\sqrt{3}}{2}$ $30°, 330°$	41. $\tan\theta = -\sqrt{3}$ $120°, 300°$
42. $\sin\theta = \frac{\sqrt{2}}{2}$ $45°, 135°$	43. $\cos\theta = -\frac{\sqrt{2}}{2}$ $135°, 225°$	44. $\tan\theta = -\frac{\sqrt{3}}{3}$ $150°, 330°$
45. $\csc\theta = 2$ $30°, 150°$	46. $\sec\theta = -2$ $120°, 240°$	47. $\cot\theta =$ undefined $0°/360°, 180°$

If you like pictures of circles, you can draw one here!



If $0\pi \le \theta \le 2\pi$, then find θ			
48. $\sin\theta = \frac{\sqrt{3}}{2}$ $\frac{\pi}{3}, \frac{2\pi}{3}$	49. $\tan\theta = 1$ $\frac{\pi}{4}, \frac{5\pi}{4}$	50. $\cos\theta = \frac{\sqrt{2}}{2}$ $\frac{\pi}{4}, \frac{7\pi}{4}$	
51. $\cos\theta = -\frac{1}{2}$ $\frac{2\pi}{3}, \frac{4\pi}{3}$	52. $\tan\theta = \sqrt{3}$ $\frac{\pi}{3}, \frac{4\pi}{3}$	53. $\cos\theta = 0$ $\frac{\pi}{2}, \frac{3\pi}{2}$	
54. $\csc\theta$ = undefined $0, \pi/2\pi, \pi$	55. $\cot\theta = -1$ $\frac{3\pi}{4}, \frac{7\pi}{4}$	56. $\sin\theta = -\frac{1}{2}$ $\frac{7\pi}{6}, \frac{11\pi}{6}$	

57. Fill in the table below.



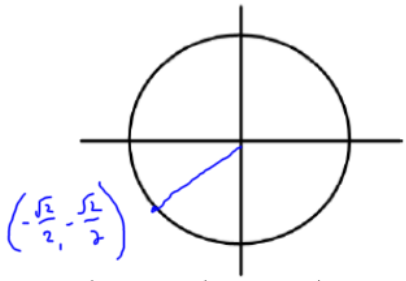
$\csc\theta = \frac{1}{-\frac{\sqrt{3}}{2}} = -\frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = -\frac{2\sqrt{3}}{3}$

$\sec\theta = \frac{1}{-\frac{1}{2}} = -2$

$\cot\theta = \frac{-\frac{1}{2}}{-\frac{\sqrt{3}}{2}} = \frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

degrees	radians	sin θ	cos θ	tan θ	csc θ	sec θ	cot θ	- degree	- radian
240°	$\frac{4\pi}{3}$	$-\sqrt{3}/2$	$-1/2$	$\sqrt{3}$	$-\frac{2\sqrt{3}}{3}$	-2	$\sqrt{3}/3$	$-120°$	$-\frac{2\pi}{3}$

58. Fill in the table below.

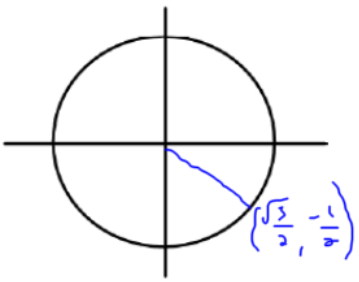


$\csc\theta = \frac{1}{-\frac{\sqrt{2}}{2}} = -\frac{2}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = -\frac{2\sqrt{2}}{2} = -\sqrt{2}$

$\sec\theta =$ ↗

degrees	radians	sin θ	cos θ	tan θ	csc θ	sec θ	cot θ	- degree	- radian
225°	$\frac{5\pi}{4}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	1	$-\sqrt{2}$	$-\sqrt{2}$	1	$-135°$	$-\frac{3\pi}{4}$

59. Fill in the table below.



$\tan\theta = \frac{-\frac{1}{2}}{\frac{\sqrt{3}}{2}} = -\frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$

$\csc\theta = \frac{1}{-\frac{1}{2}} = -2$ $\quad \cot\theta = \frac{\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = -\sqrt{3}$

$\sec\theta = \frac{1}{\frac{\sqrt{3}}{2}} = \frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$

degrees	radians	sin θ	cos θ	tan θ	csc θ	sec θ	cot θ	- degree	- radian
330°	$\frac{11\pi}{6}$	$-\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{3}}{3}$	-2	$\frac{2\sqrt{3}}{3}$	$-\sqrt{3}$	$-30°$	$-\frac{\pi}{6}$

Skillz Review! Let's put some Trig in our Algebra!

COMPLEX FRACTION aka FRACTION IN A FRACTION		
$\frac{\left(\frac{2}{3}\right)}{\left(\frac{6}{5}\right)} = \frac{2}{3} \cdot \frac{5}{6} = \frac{10}{18} = \frac{5}{9}$	$\frac{\left(\frac{1}{\cos x}\right)}{\left(\frac{1}{\sin x}\right)} = \frac{1}{\cos x} \cdot \frac{\sin x}{1} = \frac{\sin x}{\cos x} = \tan x$	$\frac{\sec\theta}{\tan\theta} = \frac{\frac{1}{\cos\theta}}{\frac{\sin\theta}{\cos\theta}} = \frac{1}{\cos\theta} \cdot \frac{\cos\theta}{\sin\theta} = \frac{1}{\sin\theta} = \csc\theta$
ADD/SUBTRACT FRACTIONS		
$\frac{2}{5} + \frac{4}{7} = \frac{14}{35} + \frac{20}{35} = \frac{34}{35}$	$\frac{1}{\sin x} + \frac{1}{3} = \frac{3}{3\sin x} + \frac{\sin x}{3\sin x} = \frac{3+\sin x}{3\sin x}$	$\tan\theta - \sec\theta = \frac{\sin\theta}{\cos\theta} - \frac{1}{\cos\theta} = \frac{\sin\theta - 1}{\cos\theta}$