Scholarship Algebra II Name _____
Circular Trig Worksheet #1
Angles and Radians

Show work on the back or on a separate sheet of paper.

Express each degree measure as a radian measure using π.

1. 240°
2. – 225°
3. 150°
4. – 60°
5. 330°
6. – 300°
7. 315°
8. 270°
9. – 108°
10. 144°

Express each radian measure as a degree measure.

11. $\frac{3\pi}{4}^R$
12. $\frac{5\pi}{3}^R$
13. $-\frac{7\pi}{4}^R$
14. $\frac{3\pi}{2}^R$
15. $\frac{5\pi}{6}^R$
16. $-\frac{3\pi}{2}^R$
17. $-\frac{11\pi}{6}^R$
18. $\frac{7\pi}{3}^R$
19. $-\frac{8\pi}{9}^R$
20. $\frac{7\pi}{12}^R$

Find the length of the arc on a circle with the given radius that is intercepted by the central angle of the given measure.

21. 35 cm; 72°
22. 2.8 cm; 330°
23. 105 cm; 150°
24. 630 mm; $\frac{5\pi}{6}^R$
25. 56 cm; $\frac{\pi}{8}^R$
26. 0.42 cm; $\frac{9\pi}{2}^R$

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Circular Trig Worksheet #2
Sine and Cosine

Sketch the angle α whose terminal side in standard position passes through the given point, and find sin α and cos α. Leave your answers in fractional form.

1. $(9, 12)$ 2. $(-4, 3)$ 3. $(5, -12)$ 4. $(7, 24)$ 5. $(0, 3)$

6. $(-2, -2)$ 7. $(3, 6)$ 8. $(-3, 1)$ 9. $(-8, -6)$ 10. $(-4, 0)$

Find sin α or cos α (whichever is not given) for α in the given quadrant.

11. $\sin\alpha = -\frac{12}{13}$; III 12. $\sin\alpha = -\frac{5}{13}$; III 13. $\cos\alpha = \frac{15}{17}$; I 14. $\cos\alpha = -\frac{21}{25}$; II

15. $\cos\alpha = \frac{1}{4}$; IV 16. $\sin\alpha = -\frac{\sqrt{3}}{2}$; IV 17. $\sin\alpha = \frac{2\sqrt{6}}{5}$; II 18. $\cos\alpha = \frac{5}{7}$; I

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Circular Trig Worksheet #3
Special Angles

Find the exact value of the given function (no decimals!).

1. $\cos 495°$
2. $\sin(-210°)$
3. $\cos 765°$
4. $\sin 600°$
5. $\sin \frac{9\pi^R}{4}$
6. $\sin \frac{5\pi^R}{2}$
7. $\cos\left(-\frac{7\pi^R}{3}\right)$
8. $\cos\left(-\frac{7\pi^R}{6}\right)$
9. $\sin\left(-\frac{4\pi^R}{3}\right)$
10. $\cos \frac{19\pi^R}{6}$
11. $\cos(-5\pi^R)$
12. $\sin \frac{15\pi^R}{4}$

Find the angle that passes through the given point. Give your answer in radians <u>and</u> degrees.

13. $(1, \sqrt{3})$
14. $(5, -5)$
15. $(-2\sqrt{3}, -2)$
16. $(9, 9)$
17. $(-3, -3)$
18. $(\sqrt{5}, -\sqrt{15})$
19. $(-\sqrt{3}, -\sqrt{3})$
20. $\left(-\frac{1}{3}, \frac{1}{3}\sqrt{3}\right)$

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Circular Trig Worksheet #4
Reference Angles

Sketch each given angle and give its reference angle in degrees.

1. 150° 2. 240° 3. 295° 4. -50° 5. -300°
6. 405° 7. -600° 8. 15° 9. -100° 10. 1000°

Sketch each given angle and give its reference angle in radians (<u>without</u> converting to degrees).

11. $\frac{5\pi}{6}$ 12. $\frac{4\pi}{3}$ 13. $-\frac{3\pi}{5}$ 14. $\frac{13\pi}{6}$ 15. $-\frac{7\pi}{3}$

Find the sine and cosine of each using reference angles. Make sure you include the proper sign.

16. 150° 17. 240° 18. -45° 19. 300° 20. -60° 21. 225°

22. $\frac{5\pi}{6}$ 23. $\frac{4\pi}{3}$ 24. $\frac{13\pi}{6}$

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Circular Trig Worksheet #5
"Nasty" Angles

Answer all questions on a separate sheet of paper. Show work and provide sketches where necessary.

Evaluate using a calculator. Provide answers rounded to four decimal places.

1. sin 136.7°	2. sin 314.8°	3. cos 226°	4. cos 117°
5. sin (-128°)	6. cos (-251°)	7. cos 339°	8. sin 675°
9. cos (-3.4^R)	10. sin (-2.7^R)	11. sin 8.7^R	12. cos 11.6^R

Determine the measure of $\propto$ such that $0° \le \propto < 360°$. Give your answer to the nearest tenth of a degree.

13. sin $\propto$ = -0.2079; cos $\propto$ < 0	14. cos $\propto$ = 0.9239; sin $\propto$ < 0
15. cos $\propto$ = -0.1132; sin $\propto$ < 0	16. sin $\propto$ = 0.7716; cos $\propto$ < 0
17. cos $\propto$ = -0.9150; sin $\propto$ > 0	18. sin $\propto$ = -0.7408; cos $\propto$ < 0
19. sin $\propto$ = 0.8854; cos $\propto$ < 0	20. cos $\propto$ = -0.2538; sin $\propto$ < 0

Determine the measure of $\propto$ such that the terminal side of $\propto$ passes through the given point and $0° \le \propto < 360°$. Give your answer to the nearest tenth of a degree.

21. (-20, 21)	22. (-15, -8)	23. $\left(2, -\sqrt{5}\right)$	24. $\left(-7, 6\sqrt{2}\right)$
25. (3, -4)	26. (-5, 12)	27. (-9, -40)	28. $\left(3, -2\sqrt{10}\right)$

Determine the measure of $\propto$ such that the terminal side of $\propto$ passes through the given point and $0^R \le \propto < 2\pi^R$. Give your answer in radians to the nearest hundredth.

29. (15, -8)	30. $\left(-\sqrt{7}, 3\right)$	31. $\left(-2, -3\sqrt{5}\right)$	32. $\left(7, -4\sqrt{2}\right)$

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Circular Trig Worksheet #6
The Other Trig Functions

Answer all questions on a separate sheet of paper. Show work and provide sketches where necessary.

Find the value to four decimal places using your calculator.

1. tan 132°	2. sec 305°	3. csc 213°	4. tan 325°
5. cot 247.3°	6. csc 289.7°	7. sec 2.46^R	8. cot 3.75^R
9. tan 5.87^R	10. csc 6.02^R	11. cot 3.5^R	12. sec 0.74^R

Find $\propto$ to the nearest tenth of a degree so that $0° \le \propto \le 90°$

13. tan $\propto$ = 1.904	14. sec $\propto$ = 1.080	15. csc $\propto$ = 1.313
16. tan $\propto$ = 5.000	17. sec $\propto$ = 1.271	18. cot $\propto$ = 4. 372

Find $\propto$ to the nearest tenth of a degree so that $\propto$ lies in the given quadrant

19. IV: tan $\propto$ = -0.7265	20. II: csc $\propto$ = 1.244	21. III: sec $\propto$ = -1.108
22. II: cot $\propto$ = -0.3899	23. IV: csc $\propto$ = -2.572	24. III: tan $\propto$ = 8.000

Find the values of all six trigonometric functions of the angle whose terminal side passes through the given point. Give all answers as reduced fractions in simplified radical form.

25. (6, -8)	26. (-5, 12)	27. (0, -3)	28. (-7, -24)
29. (-2, 0)	30. (3, 6)	31. $\left(2\sqrt{6}, -5\right)$	32. $\left(-4, 2\sqrt{5}\right)$

Find the values of the other five trigonometric functions of $\propto$ having the given information. Give all answers as reduced fractions in simplified radical form.

33. $\sin\alpha = -\frac{\sqrt{3}}{2}; Q_{IV}$	34. $\sin\alpha = -\frac{1}{\sqrt{2}}; Q_{III}$	35. $\sin\alpha = \frac{\sqrt{5}}{3}; Q_{II}$
36. $\sec\alpha = -\frac{3}{2\sqrt{2}}; Q_{III}$	37. $\csc\alpha = \frac{7}{\sqrt{15}}; Q_{II}$	38. $\cos\alpha = \frac{2}{\sqrt{13}}; Q_{IV}$
39. $\tan\alpha = \frac{1}{5}; Q_{III}$	40. $\cot\alpha = -\frac{3\sqrt{5}}{2}; Q_{II}$	