Pre-Calculus
WS 4.1-4.3

Name _____

Calculator OK!

For 1-4, convert to degrees or radians. Round to the nearest hundredth where necessary.

1) 140° $140° \left(\frac{\pi}{180}\right) = \boxed{\frac{7\pi}{9}}$

2) 82° $82° \left(\frac{\pi}{180°}\right) = \boxed{\frac{41\pi}{90}}$

3) $\frac{8\pi}{9}$ $\frac{8\pi}{9}\left(\frac{180}{\pi}\right) = \boxed{160°}$

4) 5 radians $5\left(\frac{180}{\pi}\right) = \boxed{\frac{900}{\pi}} \approx \boxed{286.48°}$

For #5, assume that θ is an acute angle in a right triangle satisfying the given conditions. Evaluate the remaining trigonometric functions.

5) $\sec\theta = \dfrac{17}{5}$

$\sin\theta = \dfrac{2\sqrt{66}}{17}$ $\cos\theta = \dfrac{5}{17}$ $\tan\theta = \dfrac{2\sqrt{66}}{5}$

$\csc\theta = \dfrac{17}{2\sqrt{66}}$ $\cot\theta = \dfrac{5}{2\sqrt{66}}$

What does the angle measure (in degrees)? $\cos^{-1}\left(\frac{5}{17}\right) = 72.9°$

For 6-7, solve for the variable shown.

6) 35°, 6, z

$\sin 35° = \dfrac{6}{z}$

$z = \dfrac{6}{\sin 35} = \boxed{10.46}$

7) 14, 43°, x

$\tan 43° = \dfrac{14}{x}$

$x = \dfrac{14}{\tan 43} = \boxed{15.01}$

For #8, use the diagram and information below to set up and solve the appropriate equation.

8) The Chrysler Building in New York City was the tallest building in the world at the time it was built. It casts a shadow approximately 130 feet long on the street when the sun's rays form an 82° angle with the earth. How tall is the building?
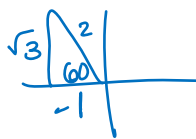
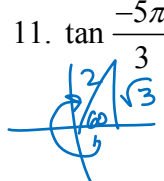h, 82°, 130 feet
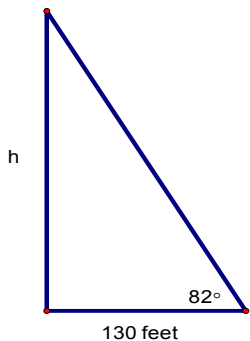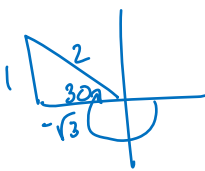
$\tan 82° = \dfrac{h}{130}$

$\boxed{h = 925.0 \text{ ft}}$

NO CALCULATOR!

Find the exact value of each trig function (NO DECIMAL ANSWERS).

9. $\sin 4\pi$

cs
(1,0)

$= \boxed{0}$

10. $\cos 120°$

$= \boxed{-\dfrac{1}{2}}$
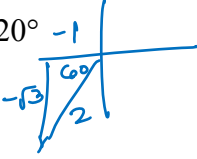
$\sqrt{3}$ 2
60
-1

11. $\tan \dfrac{-5\pi}{3}$ $= \boxed{\sqrt{3}}$

2 $\sqrt{3}$
60

12. $\sec -210°$

2
30
$-\sqrt{3}$

$\boxed{-\dfrac{2}{\sqrt{3}}}$ OR

$\dfrac{-2\sqrt{3}}{3}$

13. $\cos 420°$

420
-360
60

2
60
1

$\boxed{\dfrac{1}{2}}$

14. $\cot \dfrac{7\pi}{4}$

$\boxed{-1}$

$\sqrt{2}$
45
$-\sqrt{2}$
2

15. $\cos \pi$ (-1,0)

π

$\boxed{-1}$

16. $\sec -120°$ -1

$\boxed{-\dfrac{1}{2}}$

60
$-\sqrt{3}$
2

17. $\sin -\dfrac{5\pi}{6}$

$\boxed{-\dfrac{1}{2}}$
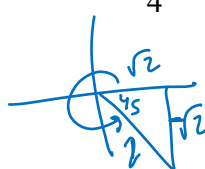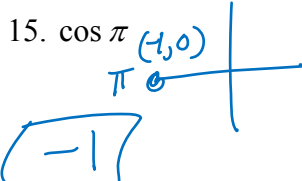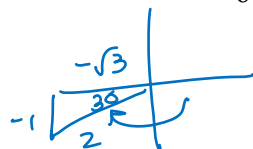
$-\sqrt{3}$
30
-1
2

Find a positive and negative angle coterminal with the given angle.

18. $420°$

$420° + 360° = \boxed{780°}$ OR

$420° - 360° = \boxed{60°}$

$60° - 360° = \boxed{-300°}$

19. $\dfrac{3\pi}{4}$

$\dfrac{8\pi}{4}$

$\dfrac{3\pi}{4} + 2\pi = \boxed{\dfrac{11\pi}{4}}$

$\dfrac{3\pi}{4} - \dfrac{8\pi}{4} = \boxed{-\dfrac{5\pi}{4}}$

20. $\dfrac{7\pi}{6}$

$\dfrac{7\pi}{6} + \dfrac{12\pi}{6} = \boxed{\dfrac{19\pi}{6}}$

$\dfrac{7\pi}{6} - \dfrac{12\pi}{6} = \boxed{\dfrac{-5\pi}{6}}$