7.4 B worksheet Name ____________________________

Find the measure of each reference angle.

1. 153^0 II
$180 - 153 = 27°$

2. 452^0 QII
$452 - 360 = 92$
$180 - 92 = 88°$

3. $-58^0 + 360° = 302$ QIV
$360 - 302 = 58°$

4. $-105^0 + 360°$
$255°$ QIII
$255 - 180 =$
$75°$

Evaluate the exact value of each expression in simplest rationalized radical form.

5. $\sin\left(-\frac{\pi}{3}\right)$ QIV
$-\frac{\sqrt{3}}{2}$

6. $\cos(-10\pi)$ $+10\pi = 0$
$(1,0)$
1

7. $\sin(-495^0)$ $+720°$
$\sin 225°$ QIII
$-\sin 45°$
$-\frac{\sqrt{2}}{2}$

8. $\cos(765^0)$ $-720°$
$\cos 45°$ QI
$\frac{\sqrt{2}}{2}$

9. $\cos\left(-\frac{19\pi}{6}\right)$ $+\frac{24\pi}{6}$
$\cos\frac{5\pi}{6}$ QII
$-\cos\frac{\pi}{6} = -\frac{\sqrt{3}}{2}$

10. $\sin 1305^0$ $-1080°$
$\sin 225°$ QIII
$-\sin 45°$
$-\sqrt{2}/2$

11. $\cos(-240^0)$ $+360°$
$\cos 120°$ QII
$-\cos 60°$
$-1/2$

12. $\sin\left(\frac{4\pi}{3}\right)$ QIII
$-\sin\frac{\pi}{3}$
$-\frac{\sqrt{3}}{2}$

13. $\cos(-270^0)$ $+360°$
$\cos 90°$
$(0,1)$
0

14. $\cos(-180^0)$ $+360°$
$\cos 180°$
$(-1,0)$
-1

15. $\sin 360^0$ $(1,0)$
0

16. $\sin -270^0$ $+360°$
$\sin 90°$ $(0,1)$
1

17. $\sin\left(\frac{\pi}{2}\right)$ $(0,1)$
1

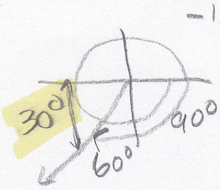
18. $\sin\left(\frac{3\pi}{2}\right)$ $(0,-1)$
-1

19. $\cos\left(\frac{7\pi}{6}\right)$ QIII
$-\cos\frac{\pi}{6}$
$-\frac{\sqrt{3}}{2}$

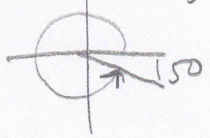
20. $\sin\left(-\frac{7\pi}{6}\right)$ $+\frac{12\pi}{6}$
$\sin\frac{5\pi}{6}$ QII
$+\sin\frac{\pi}{6} = \frac{1}{2}$

Sketch the angle. Then find its reference angle.

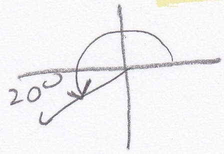
21. -510^0 $+360 = -150°$



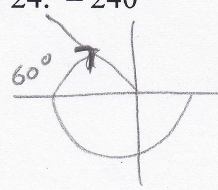
22. 345^0 $15°$



23. 200^0 $20°$

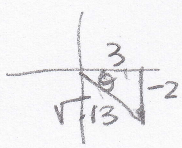


24. -240^0 $60°$



Use the given point on the terminal side of an angle θ in standard position. Evaluate the sine and cosine of θ.

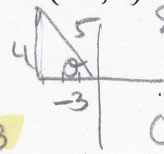
25. $(3, -2)$



$\sin\theta = \frac{-2}{\sqrt{13}} = \frac{-2\sqrt{13}}{13}$

$\cos\theta = \frac{3}{\sqrt{13}} = \frac{3\sqrt{13}}{13}$

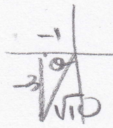
26. $(-3, 4)$



$\sin\theta = \frac{4}{5}$

$\cos\theta = \frac{-3}{5}$

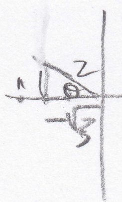
27. $(-1, -3)$



$\sin\theta = \frac{-3}{\sqrt{10}} = \frac{-3\sqrt{10}}{10}$

$\cos\theta = \frac{-1}{\sqrt{10}} = \frac{-\sqrt{10}}{10}$

28. $\left(-\sqrt{3}, 1\right)$



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

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

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

29. 105^0 $+360^\circ = 465^0$
$105^0 - 360^0 = -255^0$

30. -75^0 $+360^\circ = 285^0$
$-75^0 - 360^0 = -435^0$

31. $\frac{4\pi}{3}$ $+\frac{2\pi}{1}\cdot\frac{3}{3} = \frac{10\pi}{3}$
$\frac{4\pi}{3} - \frac{2\pi}{1}\cdot\frac{3}{3} = -\frac{2\pi}{3}$

32. $\frac{-\pi}{4}$ $+\frac{2\pi}{1}\cdot\frac{4}{4} = \frac{7\pi}{4}$
$-\frac{\pi}{4} - \frac{2\pi}{1}\cdot\frac{4}{4} = -\frac{9\pi}{4}$

Rewrite each degree measure in radians and each radian measure in degrees.

33. 315^0 $\frac{315}{1}\cdot\frac{\pi}{180^\circ} = \frac{7\pi}{4}$

34. -75^0 $\frac{-75}{1}\cdot\frac{\pi}{180^0} = -\frac{5\pi}{12}$

35. $\frac{-3\pi}{4}$ $\cdot\frac{180^0}{\pi} = -135^0$

36. $\frac{5\pi}{6}$ $\cdot\frac{180^0}{\pi} = 150^0$

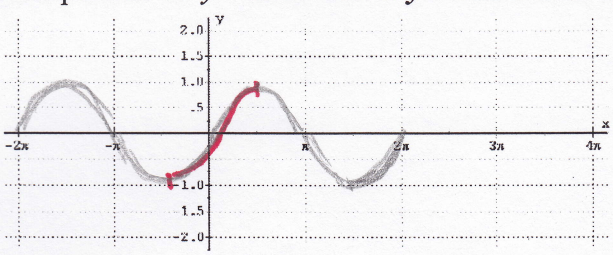
37. Find the arc length and area of a sector with the given radius 8m and central angle $\theta = 210^0$

$S = \frac{210^0}{360^0}\cdot 2\pi\cdot 8 = \frac{28\pi}{3}$ m ; $K = \frac{210^0}{360^0}\cdot\pi\cdot 8^2 = \frac{112\pi}{3}$ m^2

38. Find the arc length and area of a sector with the given radius 5cm and central angle $\theta = 2$ radians

$S = r\theta = 2\cdot 5 = 10$ cm ; $K = \frac{1}{2}r^2\theta = \frac{1}{2}\cdot(5)^2(2) = 25$ cm^2

39. Graph $y = \sin x$ over $-2\pi \le x \le 2\pi$. Does it have an inverse? Why or why not? no not 1-1
Darken the portion of $y = \sin x$ that is **y = Sin x that has an inverse.**

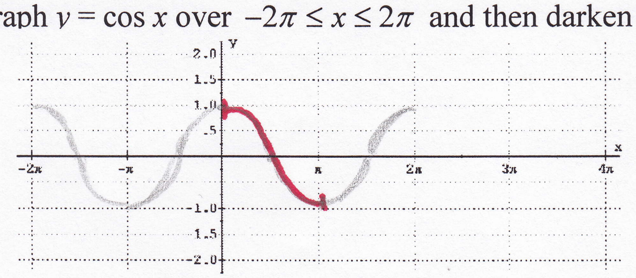


x	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
y	0	1	0	-1	0

$y = \sin x$: Domain all real #s Range: $-1 \le y \le 1$

$y = Sin x$: Domain $-\frac{\pi}{2} \le x \le \frac{\pi}{2}$ Range: $-1 \le y \le 1$

b) Graph $y = \cos x$ over $-2\pi \le x \le 2\pi$ and then darken the portion of $y = \cos x$ that is **y = Cos x**



x	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
y	1	0	-1	0	1

$y = \cos x$: Domain all real # Range: $-1 \le y \le 1$

$y = Cos x$: Domain $0 \le x \le \pi$ Range: $-1 \le y \le 1$

Why doesn't y = cos x have an inverse? not 1-1
Why do we need to restrict the domain for y = Cos x? so it will have an inverse