Name Key Date _____ Period _____

Coterminal, Reference, and Finding Values of Trig Functions

Find two angles (one in a clockwise direction and the other in a counterclockwise direction, from the given angle) that are coterminal to the following:

1. 330° 690°, -30°

330+360=690

330-360=-30

2. -75° 285°, -435°

-75+360=285

-75-360=-435

3. 450° 90°, 810°

450-360=90°

450+360=

4. 35° -325°, 395°

35-360=-325

35+360=

5. $\frac{5\pi}{6}$ $\frac{17\pi}{6}$, $\frac{-7\pi}{6}$

$\frac{5\pi}{6}+\frac{12\pi}{6}=\frac{17\pi}{6}$

$\frac{5\pi}{6}-\frac{12\pi}{6}=\frac{-7\pi}{6}$

6. $-\frac{\pi}{2}$ $\frac{3\pi}{2}$, $\frac{-5\pi}{2}$

$-\frac{\pi}{2}+\frac{4\pi}{2}=\frac{3\pi}{2}$

$-\frac{\pi}{2}-\frac{4\pi}{2}=-\frac{5\pi}{2}$

7. $\frac{13\pi}{6}$ $\frac{\pi}{6}$, $\frac{25\pi}{6}$

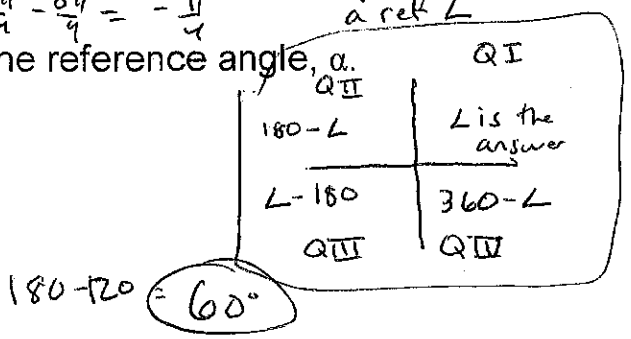
$\frac{13\pi}{6}-\frac{12\pi}{6}=\frac{\pi}{6}$ $\frac{13\pi}{6}+\frac{12\pi}{6}=\frac{25\pi}{6}$

8. $\frac{7\pi}{4}$ $\frac{15\pi}{4}$, $\frac{-\pi}{4}$

$\frac{7\pi}{4}+\frac{8\pi}{4}$ $\frac{7\pi}{4}-\frac{8\pi}{4}=-\frac{\pi}{4}$

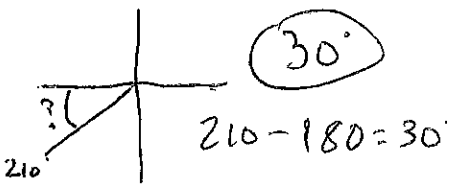
Draw each angle, θ, in standard position. Find the reference angle, α. Label θ and α.

How to find a ref ∠



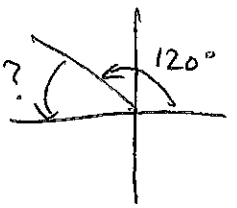
180-120=60°

9. θ = 210°

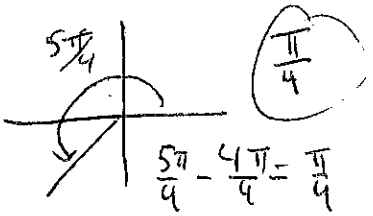


210-180=30

10. θ = 120°

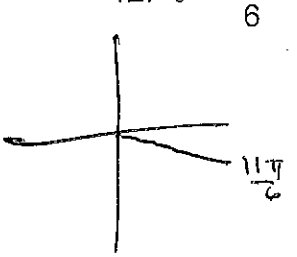


11. θ = $\frac{5\pi}{4}$

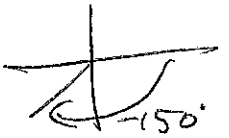


$\frac{5\pi}{4}-\frac{4\pi}{4}=\frac{\pi}{4}$

12. θ = $\frac{11\pi}{6}$



$\frac{12\pi}{6}-\frac{11\pi}{6}=\frac{\pi}{6}$



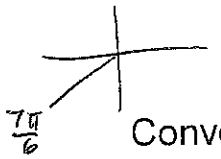
Find the reference angle for each angle.

13. 30° α = 30°

14. -150° α = 30°

15. $\frac{7\pi}{6}$ α = $\frac{\pi}{6}$

16. $\frac{5\pi}{3}$ α = $\pi/3$



Convert from radians to degrees or degrees to radians.

17. 45° = $\pi/4$ or 0.79

$45 \times \frac{\pi}{180} = \frac{45\pi}{180} = \pi/4$

18. -150° = $-5\pi/6$ or -2.62

$-150 \times \frac{\pi}{180} = \frac{-150\pi}{180} \div 3 = -\frac{5\pi}{6}$

19. 5π = 900°

$5\pi \cdot \frac{180}{\pi} = 5(180) =$

20. $\frac{-7\pi}{18}$ = -70°

$\frac{-7\pi}{18} \cdot \frac{180}{\pi} = -70$

Find the value of sine, cosine, and tangent of each of the following. (Use the unit circle)

21. 45°

Sin θ = $\sqrt{2}/2$

Cos θ = $\sqrt{2}/2$

Tan θ = 1

22. -150°

Sin θ = $-1/2$

Cos θ = $-\sqrt{3}/2$

Tan θ = $\frac{-1/2}{-\sqrt{3}/2}$

23. $\frac{5\pi}{6}$

Sin θ = $1/2$

Cos θ = $-\sqrt{3}/2$

Tan θ = $\frac{1/2}{-\sqrt{3}/2}$

24. $-\frac{7\pi}{6}$

Sin θ = $1/2$

Cos θ = $-\sqrt{3}/2$

Tan θ = $\frac{1/2}{-\sqrt{3}/2}$