Unit 10 Review
Secondary III

Name: Key
Date: _____ Class: _____

Find the nearest positive and negative co-terminal angles with the following. Also state the reference angle.

1. $\frac{3\pi}{2}$ $\frac{7\pi}{2}$, $-\frac{\pi}{2}$

2. 215° 575° -145°

3. $\frac{4\pi}{7}$ $\frac{18\pi}{7}$ $-\frac{10\pi}{7}$

4. -50° 310° -410°

Convert the following into radians or degrees.

5. $310^\circ \cdot \frac{\pi}{180}$ $= \frac{31\pi}{18}$

6. $-23^\circ \cdot \frac{\pi}{180}$ $-\frac{23\pi}{180}$

7. 137° $\frac{137\pi}{180}$

8. $\frac{3\pi}{7} \cdot \frac{180}{\pi}$ $\boxed{= \frac{540^\circ}{7}}$ $\boxed{\approx 77.1^\circ}$

9. $-\frac{6\pi}{5}$ -216°

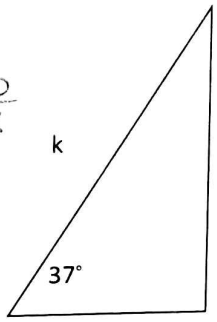
10. $\frac{5\pi}{2}$ 450°

Solve for the missing value

11.

$\sin 37^\circ = \frac{10}{k}$

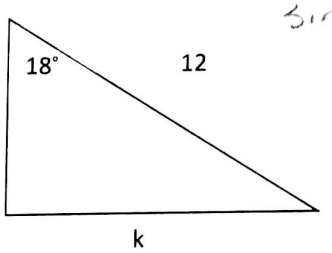
$\csc 37 = \frac{k}{10}$



$k \approx 16.616$

12.

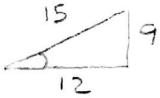
$\sin 18^\circ = \frac{k}{12}$



$k \approx 3.708$

Given the following trigonometric ratio, find the remaining 5 trigonometric functions.

13. $\sin(\theta) = \frac{9}{15}$



$\cos\theta = \frac{12}{15}$

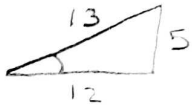
$\sec\theta = \frac{15}{12}$

$\tan\theta = \frac{9}{12}$

$\cot\theta = 12/9$

$\csc\theta = 15/9$

14. $\cot(\theta) = \frac{12}{5}$



$\sin\theta = \frac{5}{13}$

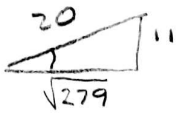
$\tan\theta = \frac{5}{12}$

$\sec\theta = \frac{13}{12}$

$\cos\theta = 12/13$

$\csc\theta = \frac{13}{5}$

15. $\csc(\theta) = \frac{20}{11}$



$\sin\theta = \frac{11}{20}$

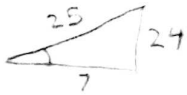
$\sec\theta = \frac{20}{\sqrt{279}}$

$\cos\theta = \frac{\sqrt{279}}{20}$

$\cot\theta = \frac{\sqrt{279}}{11}$

$\tan\theta = \frac{11}{\sqrt{279}}$

16. $\cos(\theta) = \frac{7}{25}$



$\sin\theta = \frac{24}{25}$

$\sec\theta = \frac{25}{7}$

$\tan\theta = \frac{24}{7}$

$\cot\theta = \frac{7}{24}$

$\csc\theta = \frac{25}{24}$

State which quadrants the following functions are positive in

17. Sine

I, II

18. Cosine

I, IV

19. Tangent

I, III

Evaluate the following without a calculator

20. $\csc\frac{4\pi}{3}$

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

21. $\sin\frac{11\pi}{6}$

$-\frac{1}{2}$

22. $\tan\frac{3\pi}{2}$

DNE

23. $\sec\frac{\pi}{3}$

$=2$

Evaluate the following for θ

$\frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

24. $\cos\theta = \frac{\sqrt{2}}{2}; 0 \le \theta \le \pi$

$\theta = \pi/4$

25. $\sec\theta = \sqrt{2}; \pi \le \theta \le 2\pi$

$\theta = \frac{7\pi}{4}$

26. $\tan\theta = -\sqrt{3}; \pi \le \theta \le 2\pi$

$\theta = \frac{5\pi}{3}$

27. $\sin\theta = -1; 0 \le \theta \le$ 2π

$\theta = \frac{3\pi}{2}$

State the amplitude, phase shift, period, and vertical shift of each of the following

28. $f(x) = 3\sin\left(2\left(\theta + \frac{\pi}{2}\right)\right)$

$\frac{2\pi}{2} = \pi$

Amp: 3

PS: left $\pi/2$

period: π

VS: none

29. $f(x) = 3\sin(\theta + 4) - 3$

Amp: 3

PS: left 4

period: 2π

VS: down 3

30. $f(x) = \cos\left(\frac{1}{5}(\theta + \pi)\right)$

Amp: 1

PS: left π

period: $\frac{2\pi}{1/5} = 10\pi$

VS: none

31. $f(x) = 4\cos\left(\theta + \frac{\pi}{3}\right) - \frac{\pi}{4}$

Amp: 4

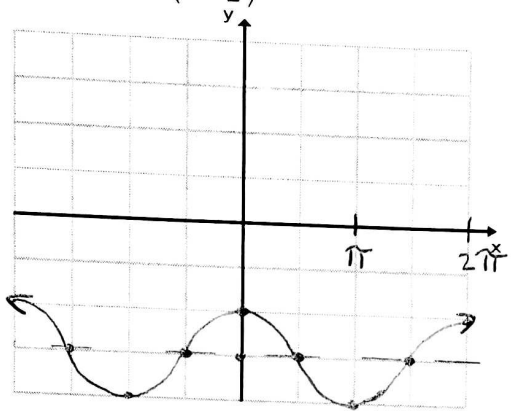
PS: left $\pi/3$

period: 2π

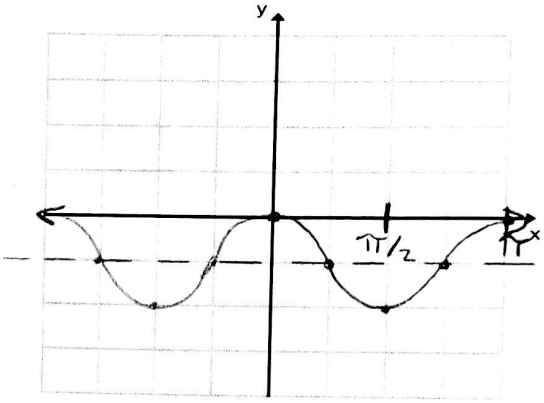
VS: down $\pi/4$

Graph the following

32. $f(x)=\sin\left(\theta+\frac{\pi}{2}\right)-3$



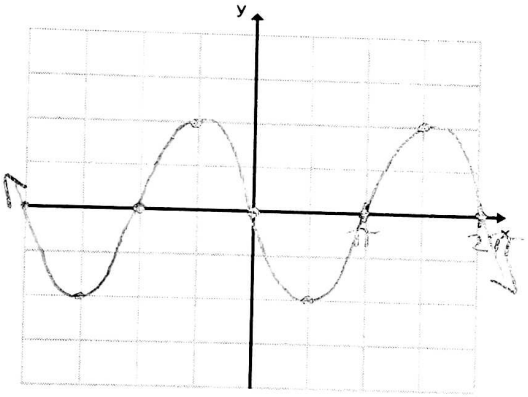
33. $f(x)=\cos(2\theta)-1$



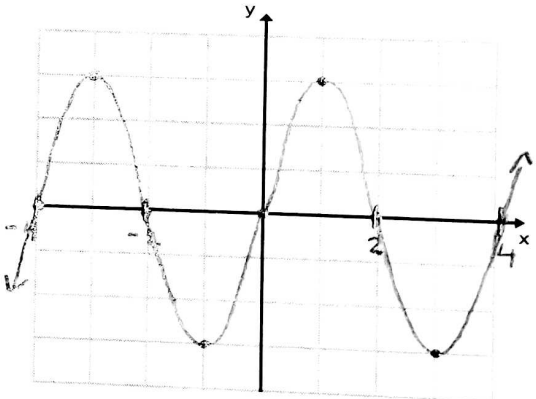
$\frac{2\pi}{\pi/2}=4$

right 1

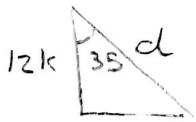
34. $f(x)=-2\sin(\theta)$



35. $f(x)=3\cos\left(\frac{\pi}{2}(\theta-1)\right)$



36. An eagle is flying 12,000 feet above the ground. It spots a snake on the ground. The angle of depression from the eagle to the snake is 35˚. How far is the eagle to the snake?

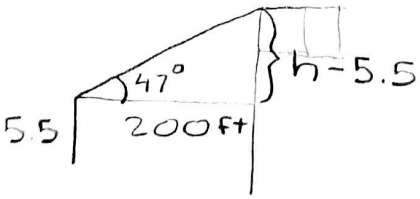


$\cos 35^\circ = \frac{12}{d}$

$\sec 35^\circ = d/12k$

$\boxed{d \approx 14{,}649 \text{ ft}}$

37. James places his survey scope on the top of a 5.5' tripod. He is 200 feet from a flagpole. He measures 47˚ of elevation to the top of the flagpole. How tall is the flagpole?



$\tan 47^\circ = \frac{h-5.5}{200}$

$\boxed{h \approx 219.98 \text{ ft}}$