Unit 9 Review
Secondary III

Name: KEY
Date: _____ Class: _____

Evaluate the following for θ

1. $\cos\theta = -\dfrac{\sqrt{2}}{2}; 0 \le \theta \le \pi$

$$\theta = \dfrac{3\pi}{4}$$

2. $\sec\theta = \dfrac{-\sqrt{2}}{\text{#}}; \pi \le \theta \le 2\pi$

$$\cos\theta = -\dfrac{\sqrt{2}}{2} \qquad \theta = \dfrac{5\pi}{4}$$

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

$$\theta = \dfrac{4\pi}{3}$$

4. $\sin\theta = 1; 0 \le \theta \le \pi$

$$\theta = \dfrac{\pi}{2}$$

Evaluate the following without a calculator

5. $\csc\dfrac{5\pi}{4}$

$\sin\dfrac{5\pi}{4} = -\dfrac{\sqrt{2}}{2}$

$-\dfrac{2}{\sqrt{2}} \cdot \dfrac{\sqrt{2}}{\sqrt{2}} = -\dfrac{2\sqrt{2}}{2}$ → $\boxed{-\sqrt{2}}$

6. $\cos\dfrac{11\pi}{6}$

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

7. $\sin\dfrac{3\pi}{2}$

-1

8. $\cot\dfrac{\pi}{3}$

$\dfrac{\sqrt{3}}{3}$

State which quadrants the following functions are positive in

9. Sine

II

10. Cosine

IV

11. Tangent

III

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

12. $\dfrac{2\pi}{3}$ RA: $\dfrac{\pi}{3}$

$\dfrac{8\pi}{3}, -\dfrac{4\pi}{3}$

13. $225°$

$585°,$
$-135°$ RA: $45°$

14. $\dfrac{7\pi}{4}$ RA: $\dfrac{\pi}{4}$

$\dfrac{15\pi}{4}, -\dfrac{\pi}{4}$

15. $-60°$

$300°, -420°$

RA: $60°$

Solve for the missing value

16.

$\cos(37°) = \dfrac{10}{k}$

$k = \dfrac{10}{\cos(37°)}$ $\boxed{k = 12.5}$

17.
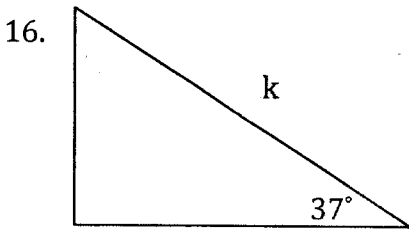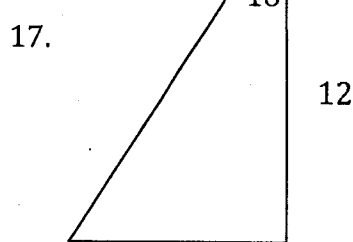
$\tan(18°) = \dfrac{k}{12}$
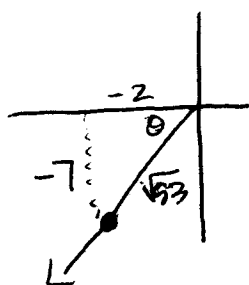
$k = 12\tan(18°) = \boxed{3.899}$

18. $\dot{P}(-3, 10)$ lies on the terminal side of an angle of rotation θ, find $\cos\theta$.
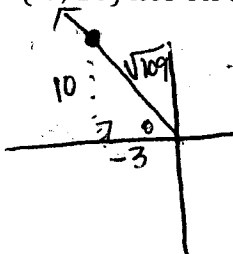
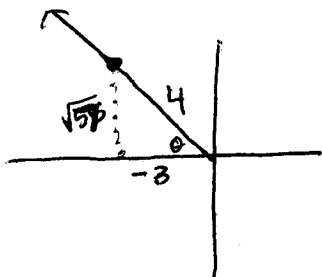$\cos\theta = \dfrac{-3}{\sqrt{109}} \cdot \dfrac{\sqrt{109}}{\sqrt{109}} = \boxed{\dfrac{-3\sqrt{109}}{109}}$

19. P(-2, -7) lies on the terminal side of an angle of rotation θ, find cscθ.

$$\sin\theta = \frac{-7}{\sqrt{53}}$$

$$\boxed{\csc\theta = -\frac{\sqrt{53}}{7}}$$

20. Given that an angle of rotation θ is in quadrant II and cosθ= -¾, find cotθ.

$$\tan\theta = \frac{\sqrt{7}}{-3}$$

$$\cot\theta = -\frac{3}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}} = \boxed{\frac{-3\sqrt{7}}{7}}$$

Convert the following into radians or degrees.

21. 320°

$$\frac{16\pi}{9}$$

22. –20°

$$\frac{-\pi}{9}$$

23. 132°

$$\frac{11\pi}{15}$$

24. $\dfrac{2\pi}{7}$

$$51.43°$$

25. $-\dfrac{\pi}{5}$

$$-36°$$

26. $\dfrac{3\pi}{2}$

$$270°$$

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

27. $f(x) = 2\sin\left(3\theta - \dfrac{\pi}{2}\right)$

Amp: 2
phase: right π/2
Vertical: none
period: 2π/3

28. $f(x) = -3\sin(\theta - 4) + 1$

Amp: 3
phase: right 4
Vertical: up 1
period: 2π

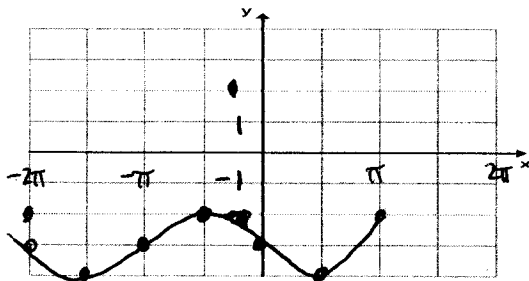29. $f(x) = \cos\left(\dfrac{\theta}{2} + \dfrac{\pi}{2}\right)$

Amp: None
phase: left π/2
Vertical: None
period: 4π

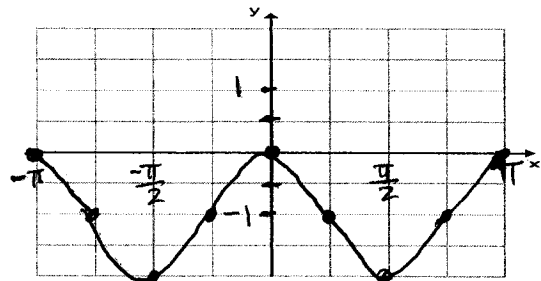30. $f(x) = \tan\left(\theta + \dfrac{\pi}{3}\right) - \dfrac{\pi}{4}$

Amp: None
phase: left π/3
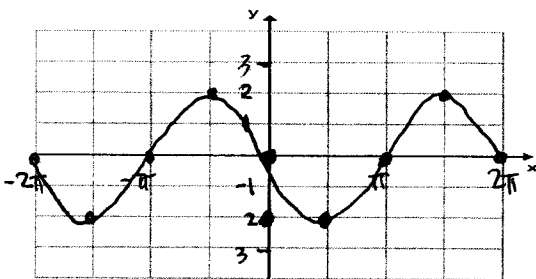Vertical: down π/4
period: 2π

Graph the following

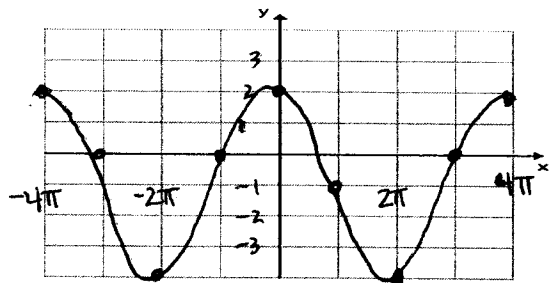31. $f(x) = \sin(\theta + 2) - 3$
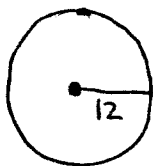
32. $f(x) = \cos(2\theta) - 1$

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

34. $f(x) = 3\cos\left(\dfrac{\theta}{2} - 1\right)$

35. You are on a merry-go-round 12 feet from the center. The merry-go-round takes 8 seconds to make a full revolution. How fast are you moving? Put your answer in feet per second.

$$\frac{12 \text{ ft}}{8 \text{ sec}} = 1.5 \text{ ft}/\text{sec}$$

36. You take your little brother to the park and you push him in a swing. When you pull the swing all the way back you release the swing 4 meters from its position at rest. Graph a sinusoidal function that represents the swings horizontal displacement relative to its position at rest if it completes one back-and-forth swing every 2 seconds. Ignore air resistance and friction.