

Name: _____ Date: _____ Period: _____

Unit 3-B Review – Trigonometric Functions

Reviews do NOT cover all material from the lessons but will hopefully remind you of key points. To be prepared, you must study all packets for lessons 3.8 – 3.15.

Write an equation that represents all asymptotes of the graph of f in the xy -plane.

1. Let $f(\theta) = \tan\left(\frac{\theta}{6}\right)$.

In the xy -plane, the angle θ is in standard position. What is the slope of the terminal ray of the angle?

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

Evaluate.

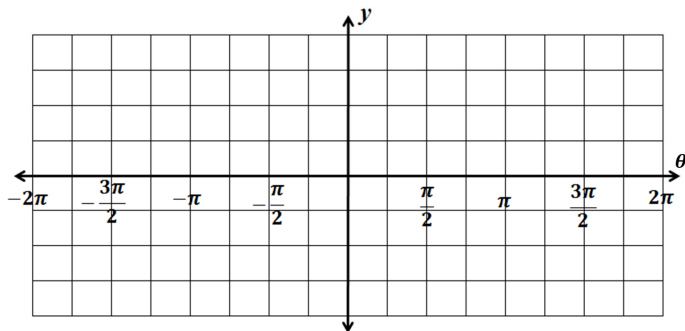
3. $\tan\frac{\pi}{6}$

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

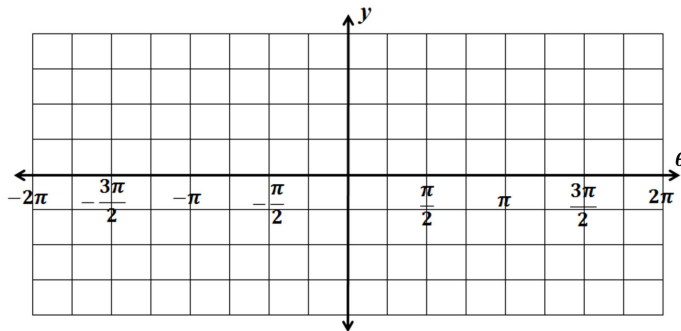
5. $\tan\frac{4\pi}{3}$

Graph each trig function.

6. $g(\theta) = \tan\left(\theta + \frac{\pi}{4}\right) - 1$

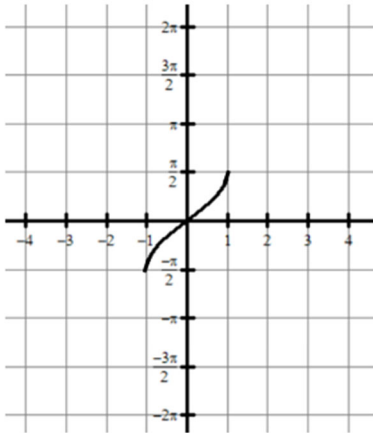


7. $g(\theta) = -2 \tan(2\theta) + 3$

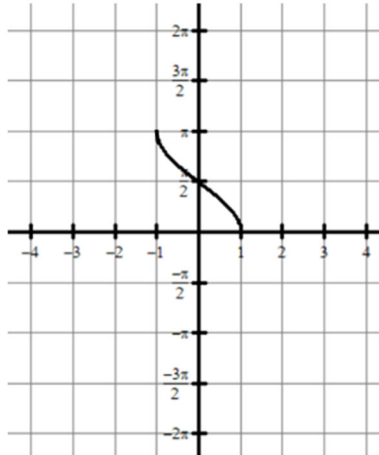


The parent function is shown below. Use the parent function to graph $g(x)$.

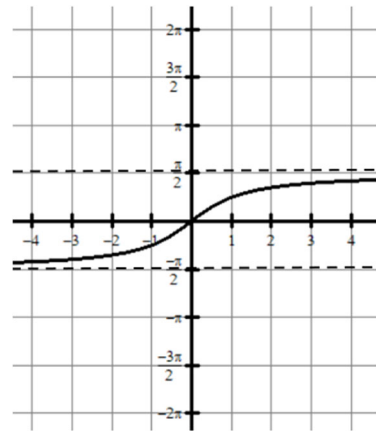
8. $g(x) = 3\sin^{-1}(-x) + \frac{\pi}{2}$



9. $g(x) = 2\cos^{-1}(x - 3)$



10. $g(x) = -\tan^{-1}(x) - \pi$



Find the inverse of each function and list the domain and range of $f^{-1}(x)$.

11. $f(x) = 2\sin x - 5$ for $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$

Solve each equation for $0 \leq \theta \leq 2\pi$. Find the exact value(s) using the unit circle

12. $2\sin \theta + 5 = 4$

13. $\cos^2 \theta + \cos \theta = 0$

Solve each equation. Find ALL approximate value(s) using a calculator.

14. $5 + 5\sin^2 x = 8$

15. $\tan^2 x - 3\tan x = 18$

Evaluate the following expressions. Use exact values.

16. $\sec\left(\frac{\pi}{3}\right)$

17. $\csc\left(-\frac{\pi}{2}\right)$

18. $\cot\left(\frac{5\pi}{6}\right)$

Evaluate the following expressions. Use approximate values from calculator.

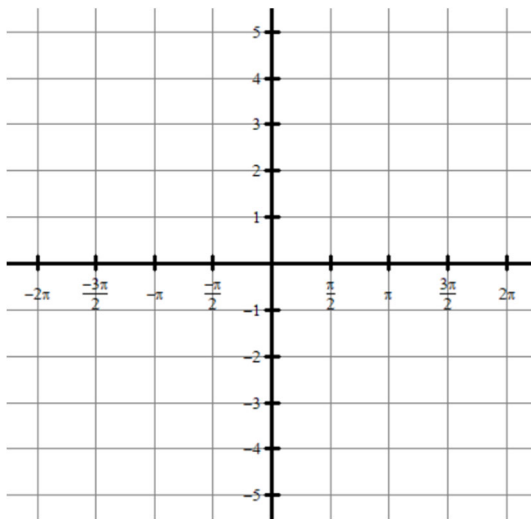
19. $\csc(1.84)$

20. $\sec\left(\frac{3\pi}{5}\right)$

21. $\cot\left(\frac{4\pi}{9}\right)$

Graph the following. State the range and all vertical asymptotes.

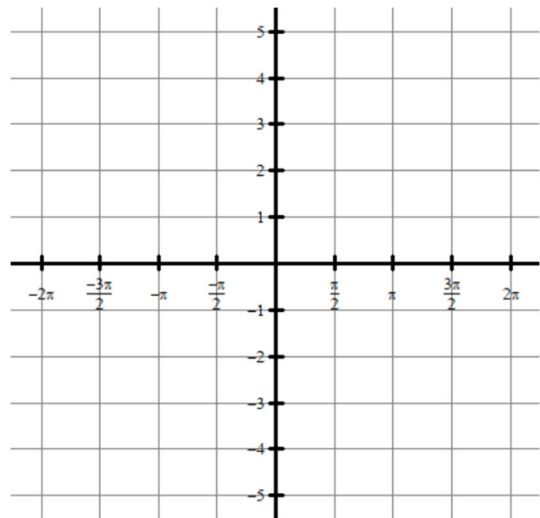
22. $f(x) = 2\csc\left(x + \frac{\pi}{2}\right) - 1$



Range:

Vertical Asymptotes:

23. $f(x) = 3\sec\left(\frac{1}{2}x\right)$



Range:

Vertical Asymptotes:

Use trig identities to write each expression in terms of a single trig identity.

24. $\cos^2 x \sec x$

25. $(1 - \sin^2 x) \csc^2 x$

26. $\frac{1}{1 + \cot^2 x}$

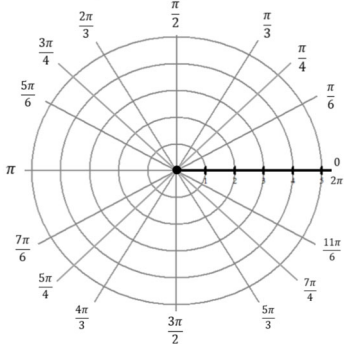
Find the exact value of the sum or difference.

27. $\sin\left(\frac{3\pi}{4} - \frac{5\pi}{6}\right)$

28. $\cos\left(\frac{\pi}{2} + \frac{2\pi}{3}\right)$

Polar Coordinates

29. Plot $\left(-3, \frac{2\pi}{3}\right)$



30. Convert from polar to rectangular.

$$\left(4, \frac{5\pi}{6}\right)$$

31. Convert from rectangular to polar where $0 \leq \theta \leq 2\pi$.

$$(2, -4)$$

32. Convert from rectangular complex to polar.

$$-3 - 5i$$

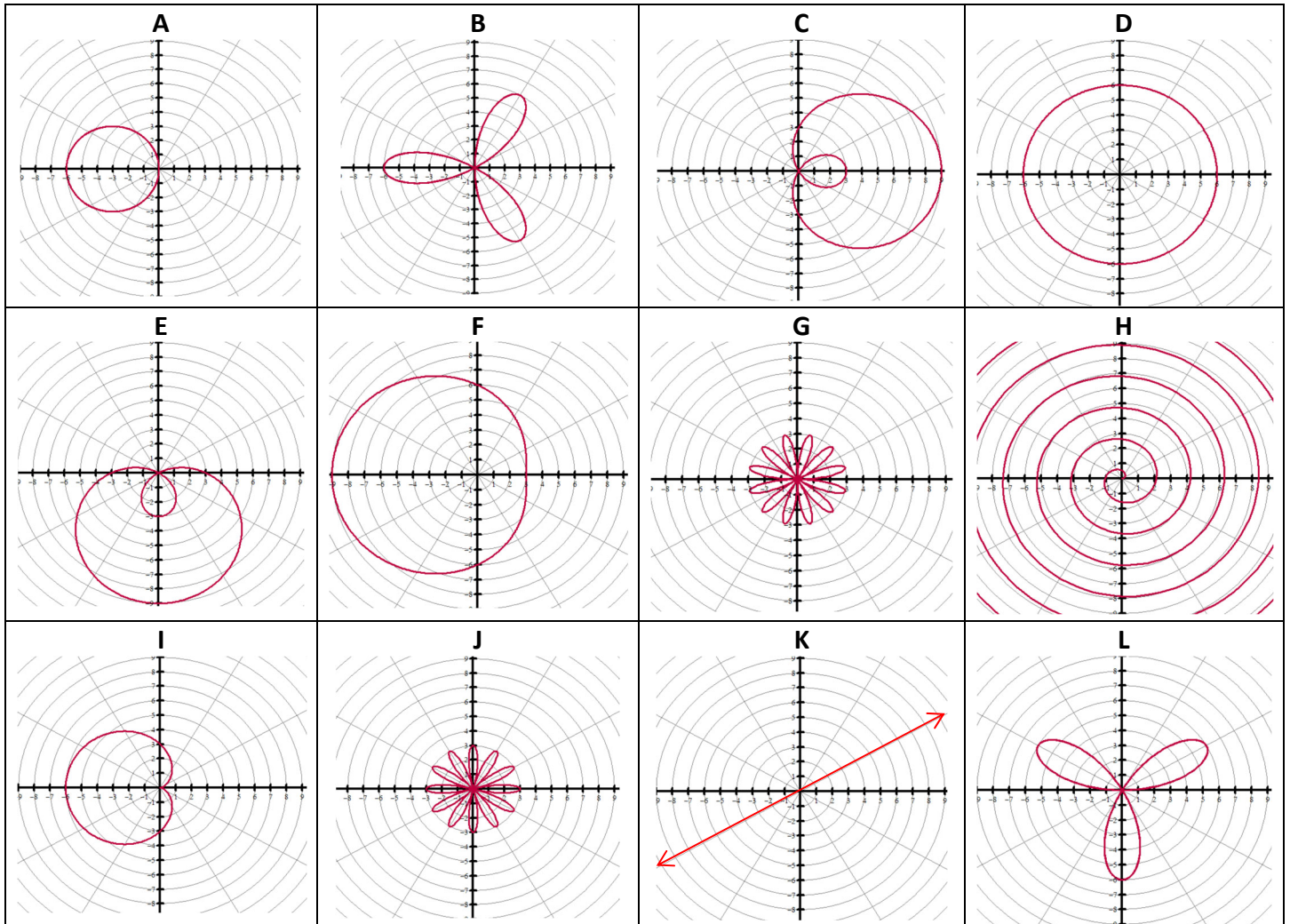
33. Convert from polar complex to rectangular.

$$6 \left[\cos\left(\frac{3\pi}{4}\right) + i \sin\left(\frac{3\pi}{4}\right) \right]$$

Match the equation to its graph below.

34. $r = 3 + 6 \cos(\theta)$ matches graph: _____	35. $r = 3 - 6 \sin(\theta)$ matches graph: _____	36. $r = 3 - 3 \cos(\theta)$ matches graph: _____
37. $r = 6 - 3 \cos(\theta)$ matches graph: _____	38. $r = -6 \cos(\theta)$ matches graph: _____	39. $r = 6 \sin(3\theta)$ matches graph: _____
40. $r = 3 \cos(6\theta)$ matches graph: _____	41. $r = \frac{\theta}{3}$ matches graph: _____	42. $r = -6 \cos(3\theta)$ matches graph: _____
43. $r = 3 \sin(6\theta)$ matches graph: _____	44. $r = 6$ matches graph: _____	45. $\theta = \frac{\pi}{3}$ matches graph: _____

GRAPHS:



Use the table of selected values for the polar function $r = f(\theta)$ to answer the following.

46.

- a. Is f increasing or decreasing on the interval $0 \leq \theta \leq \frac{\pi}{2}$?
- b. Is the distance between $f(\theta)$ and the pole is increasing or decreasing on the interval $0 \leq \theta \leq \frac{\pi}{2}$?
- c. Find the average rate of change of f between $\theta = \frac{\pi}{8}$ and $\theta = \frac{3\pi}{8}$.

θ	r
0	-5
$\frac{\pi}{8}$	-4.619
$\frac{\pi}{4}$	-3.536
$\frac{3\pi}{8}$	-1.913
$\frac{\pi}{2}$	0

- d. Estimate the value of $f\left(\frac{\pi}{4}\right)$ using an average rate of change.

Multiple Choice

47. The function f is given by $f(x) = 4 \sin(x) + 1$. For what values of x where $0 \leq x \leq 2\pi$ is $f(x) \leq -1$?

- (A) $\frac{7\pi}{6} \leq x \leq \frac{11\pi}{6}$
- (B) $\frac{4\pi}{3} \leq x \leq \frac{5\pi}{3}$
- (C) $0 \leq x \leq \frac{7\pi}{6}$ and $\frac{11\pi}{6} \leq x \leq 2\pi$
- (D) $0 \leq x \leq \frac{4\pi}{3}$ and $\frac{5\pi}{3} \leq x \leq 2\pi$