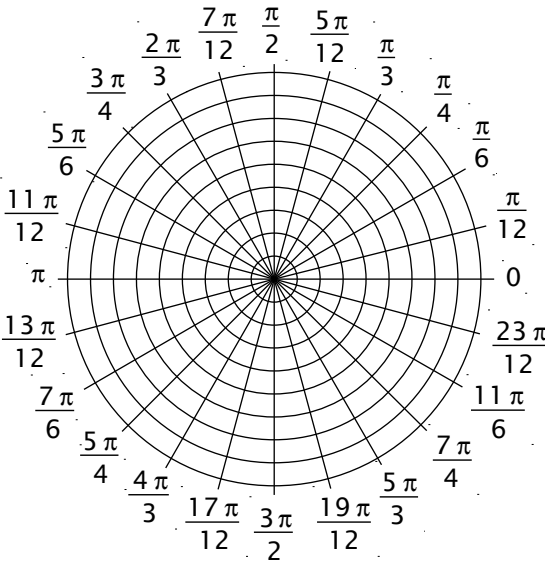**PreCalculus Placement Test**

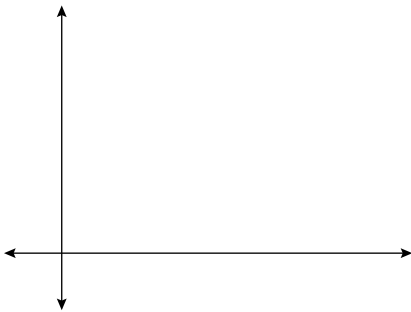Graph.

1. $r = \dfrac{2}{\cos\theta}$
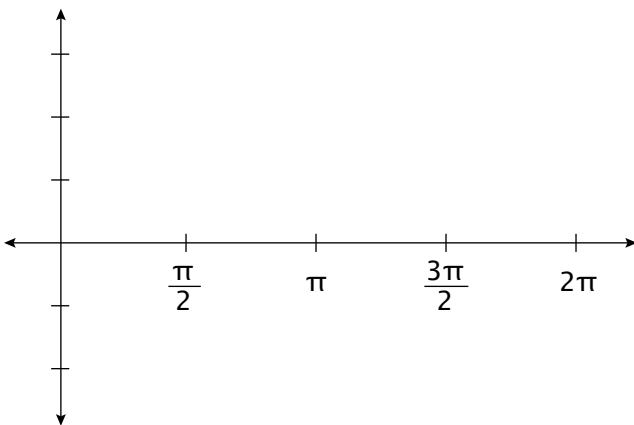

2. y = 3 sin x

3. $f(x) = e^x$

4. $y = \tan x$

$\dfrac{\pi}{2}$ π $\dfrac{3\pi}{2}$ 2π
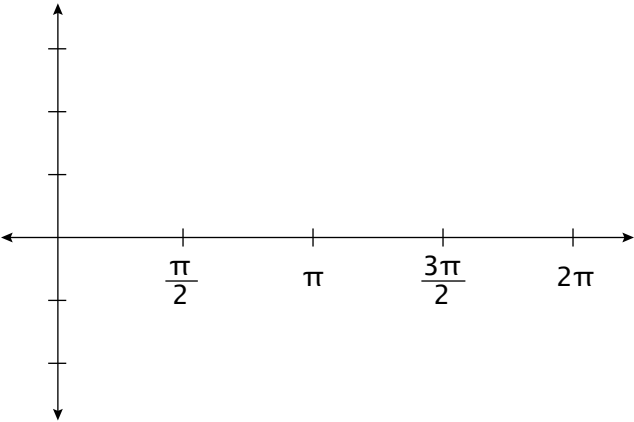
Solve for x.

5. $e^{2x} - e^{x} = 2$

6. $\dfrac{\sqrt{x+3}}{2} < 1$

7. $|x - 2| < -1$

8. $e^{2x} = 5$

Prove the identities.

9. $\tan \theta \csc \theta = \sec \theta$

10. $\csc^{2}\theta \,[\sin^{2}(90° - \theta)] + 1 = \csc^{2} \theta$

Evaluate.

11. $\lim\limits_{x \to \infty} \dfrac{1}{x}$

12. $\lim\limits_{x \to -5} \dfrac{x^2 + 3x - 10}{x + 5}$

13. $\sum\limits_{i=1}^{4} \{i^2 - 1\}$

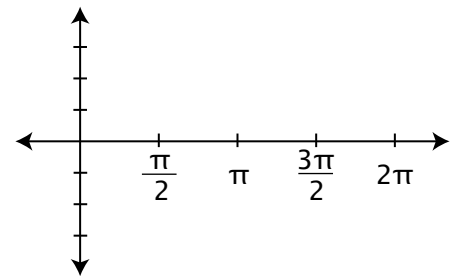14. $\sin 135° + \cos 60°$

Follow the directions.

15. If $f(x) = 2X - 3$ and $g(x) = X^2 + 1$, find $f(g(x))$.

16. Give the domain and range of the following function: $f(x) = \sqrt{x + 3}$
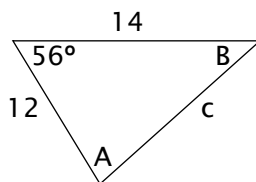
17. Change 7π/4 radians to degrees.

18. Give the reference angle and the quadrant for 250º.

19. Graph 2 sin x – 1, using the graph at right.

20. Find the first four terms of the following geometric sequence, with a_1 = –4 and r = 1/2.

21. Solve for the unknown sides and angles for the triangle shown.

22. The decay constant of a substance is determined to be .0069. How much of 10 grams will remain after 365 days? Use Q(t) = $10e^{-kt}$, where t = time in days and Q(t) is the quantity remaining at time t.