

Find the slope from the following points, graphs, and linear equations.

1. $p_1 = (2, 1)$ and $p_2 = (1, 4)$
2. $p_1 = (-3, -2)$ and $p_2 = (0, 7)$

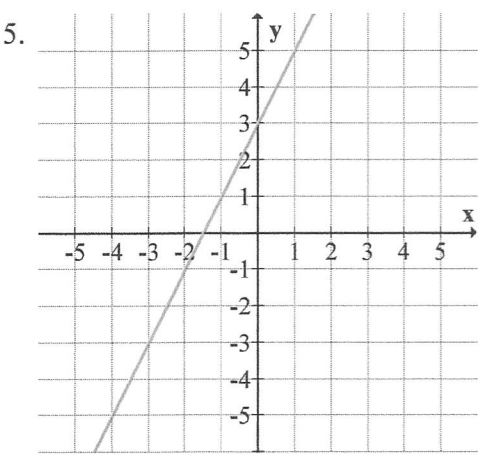
Slope: _____

Slope: _____

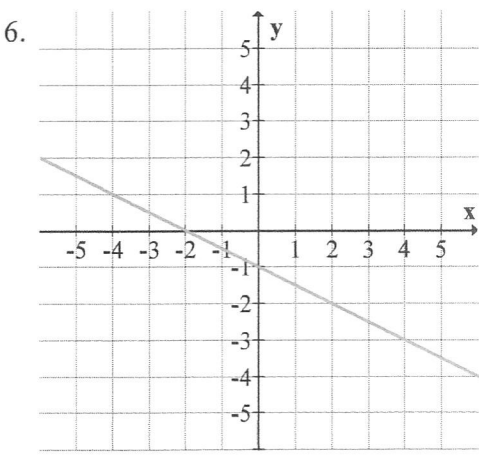
3. $p_1 = (2, 2)$ and $p_2 = (4, 2)$
4. $p_1 = (3, -2)$ and $p_2 = (3, 7)$

Slope: _____

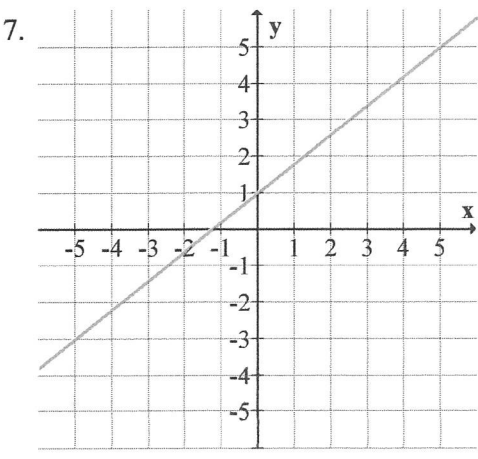
Slope: _____



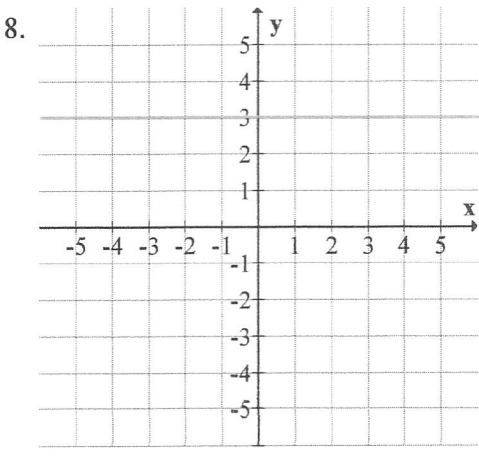
Slope: _____



Slope: _____



Slope: _____



Slope: _____

9. $y = -2x - 3$

Slope: _____

10. $y - 5 = \frac{2}{3}(x + 1)$

Slope: _____

11. $3x + 4y = 8$

12. $x = -5$

Slope: _____

Slope: _____

Write the equation of the line in all three forms given a slope and a point.

13. $m = \frac{2}{3}$ and $p = (3, 5)$

14. $m = -\frac{4}{5}$ and $p = (1, 2)$

Point-Slope: _____

Point-Slope: _____

Slope-Intercept: _____

Slope-Intercept: _____

Standard Form: _____

Standard Form: _____

Write the equation of the line in all three forms given a slope and a y-intercept.

15. $m = -3$ and y -intercept $= 5$

16. $m = -\frac{3}{2}$ and y -intercept $= -3$

Point-Slope: _____

Point-Slope: _____

Slope-Intercept: _____

Slope-Intercept: _____

Standard Form: _____

Standard Form: _____

Write the equation of the line in all three forms given two points.

17. $p_1 = (2, 2)$ and $p_2 = (4, 2)$

18. $p_1 = (3, -2)$ and $p_2 = (3, 7)$

Point-Slope: _____

Point-Slope: _____

Slope-Intercept: _____

Slope-Intercept: _____

Standard Form: _____

Standard Form: _____

19. $p_1 = (2, 1)$ and $p_2 = (1, 4)$

20. $p_1 = (-3, -2)$ and $p_2 = (0, 7)$

Point-Slope: _____

Point-Slope: _____

Slope-Intercept: _____

Slope-Intercept: _____

Standard Form: _____

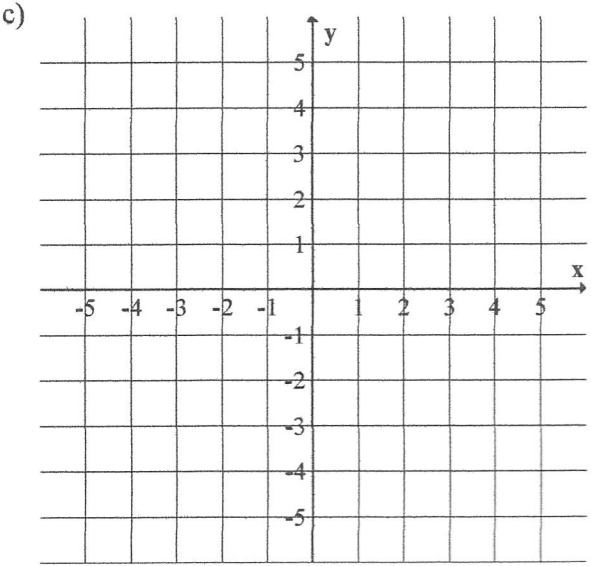
Standard Form: _____

For the following functions find the a) domain, b) range, c) graph, and d) any symmetries.

1. $y = 4 - x^2$

a) _____

b) _____

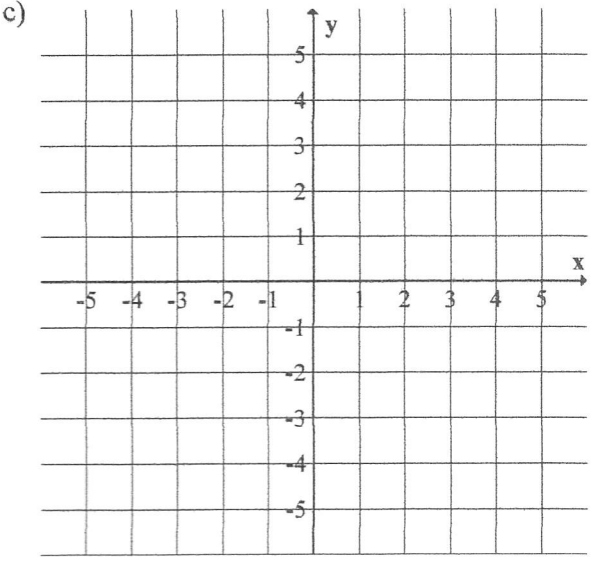


d) _____

2. $y = 2 + \sqrt{x - 1}$

a) _____

b) _____

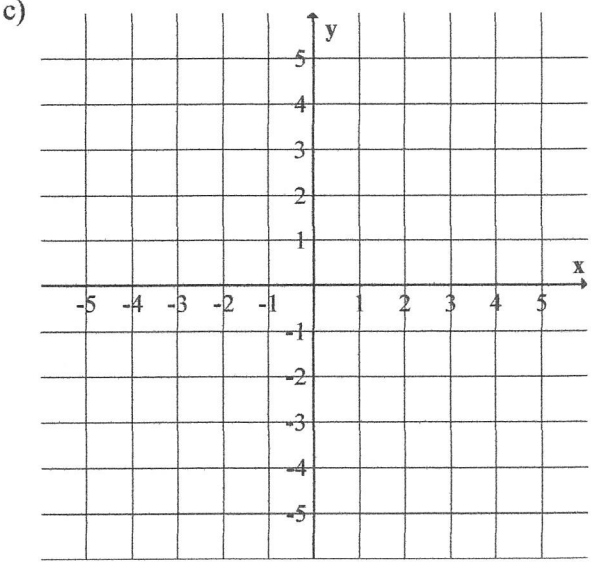


d) _____

3. $y = 1 + \frac{1}{x}$

a) _____

b) _____

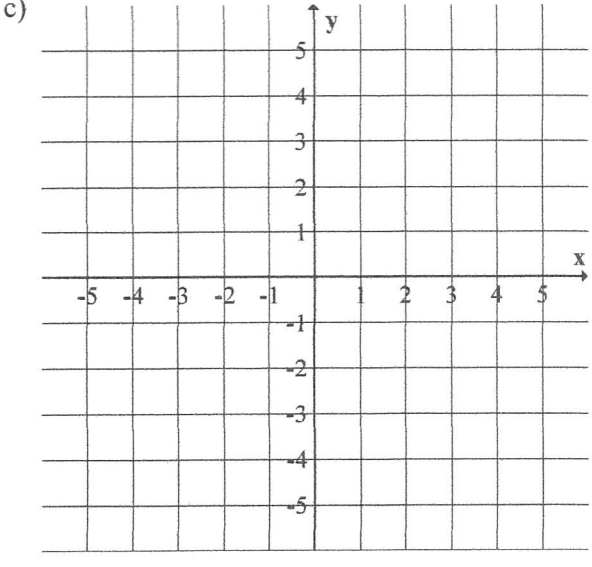


d) _____

4. $y = x^{2/3}$

a) _____

b) _____



d) _____

Determine if the following functions are even, odd, or neither.

5. $y = \frac{1}{x-1}$

6. $y = \frac{1}{x^2-1}$

7. $y = x^4$

8. $y = \sqrt{x^2 + 2}$

9. $y = \frac{x^3}{x^2-1}$

10. $y = \sqrt[3]{2-x}$

For the following functions find a) $f(g(x))$, b) $g(f(x))$, c) $f(g(0))$, d) $g(f(0))$, e) $g(g(-2))$, and f) $f(f(x))$.

11. $f(x) = x + 5, g(x) = x^2 - 3$

12. $f(x) = x + 1, g(x) = x - 1$

a) _____

a) _____

b) _____

b) _____

c) _____

c) _____

d) _____

d) _____

e) _____

e) _____

f) _____

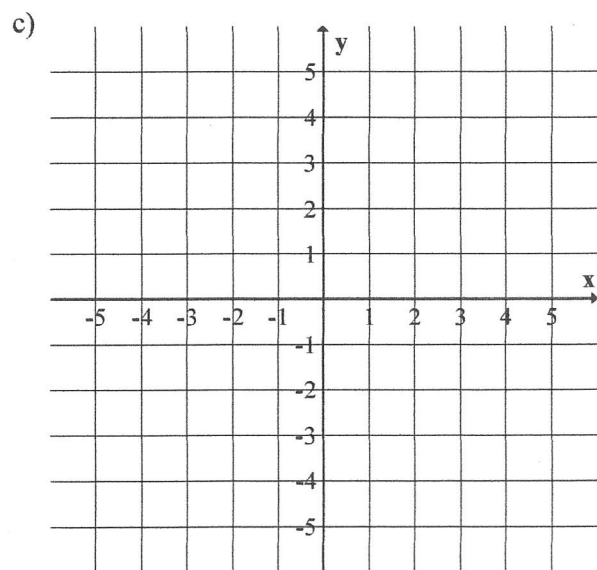
f) _____

For the following functions find the a) domain, b) range, c) graph, and d) any intercepts.

1. $y = -2^x + 3$

a) _____

b) _____

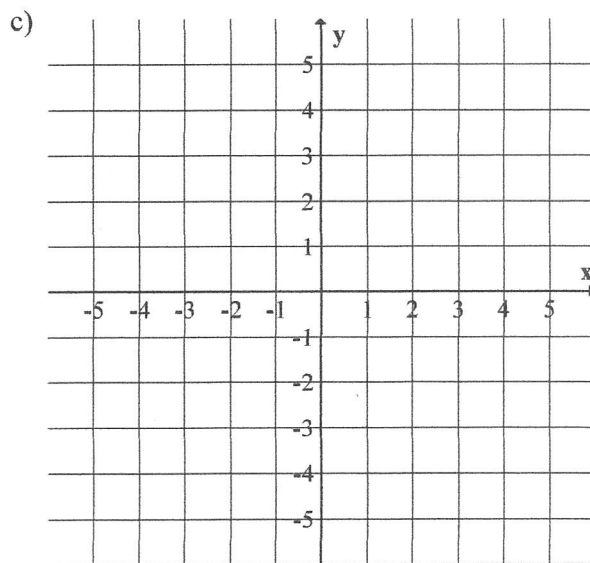


d) _____

2. $y = e^x + 3$

a) _____

b) _____

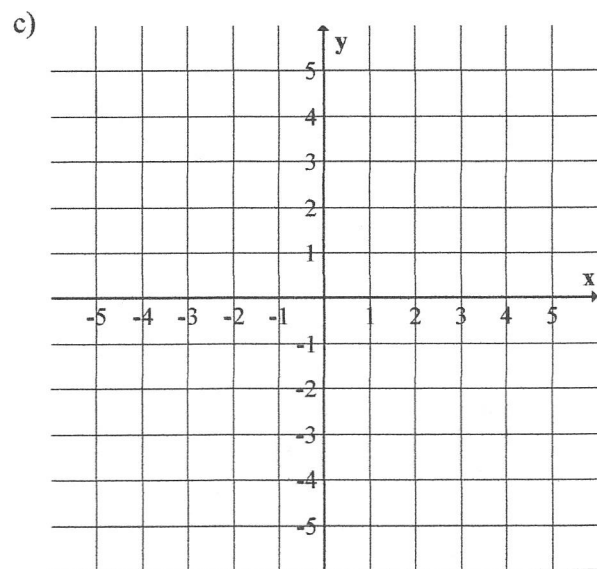


d) _____

3. $y = 3e^{-x} - 2$

a) _____

b) _____

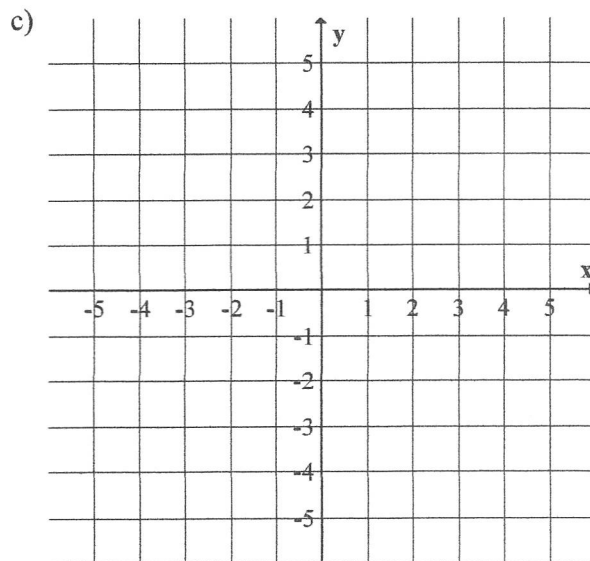


d) _____

4. $y = -2^{-x} - 1$

a) _____

b) _____



d) _____

5. The population of Standardsville is 500,000 and is increasing at the rate of 3.75% each year. Approximately when will the population reach 1 million?
6. The half-life of phosphorus-32 is about 14 days. There are 6.6 grams present initially.
- Express the amount of phosphorus-32 remaining as a function of time t .
 - When will there be 1 gram remaining?
7. Determine how much time is required for an investment to triple if interest is earned at the rate of 4.25% compounded weekly (remember 52 weeks in a year)?
8. Suppose that a colony of bacteria starts with 1 bacterium and doubles in number every half hour. How much bacteria will the colony contain at the end of 24 hours?

Rewrite the following exponential expressions to have the indicated base.

9. 9^{2x} , base 3

10. 16^{3x} , base 2

11. $\left(\frac{1}{27}\right)^x$, base 3

Find f^{-1} and verify that $(f \circ f^{-1})(x) = (f^{-1} \circ f)(x) = x$.

1. $f(x) = 2x + 3$

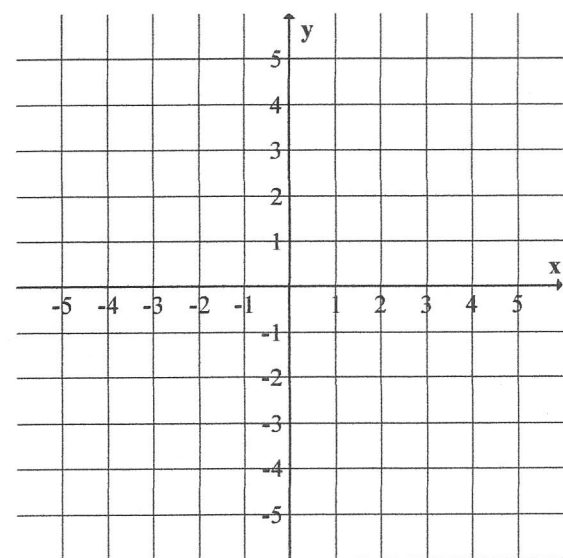
2. $f(x) = x^3 - 1$

3. $f(x) = \frac{x+3}{x-2}$

4. $f(x) = x^2 + 2x + 1$

Graph the given function $f(x)$, its inverse $f^{-1}(x)$ and $y = x$ on the same axes in different colors.

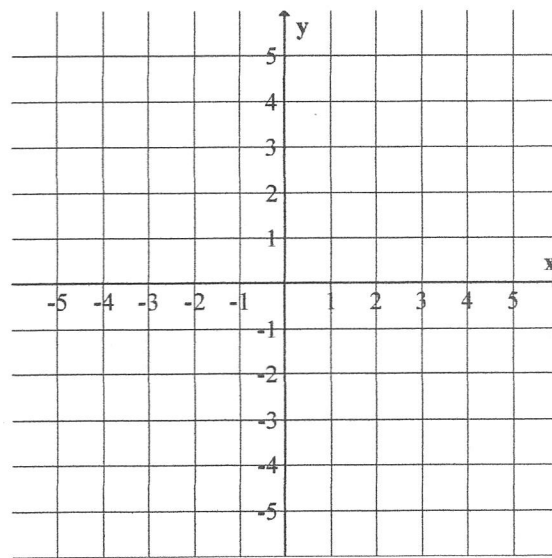
5. $f(x) = e^x$



$f(x) =$

$f^{-1}(x) =$

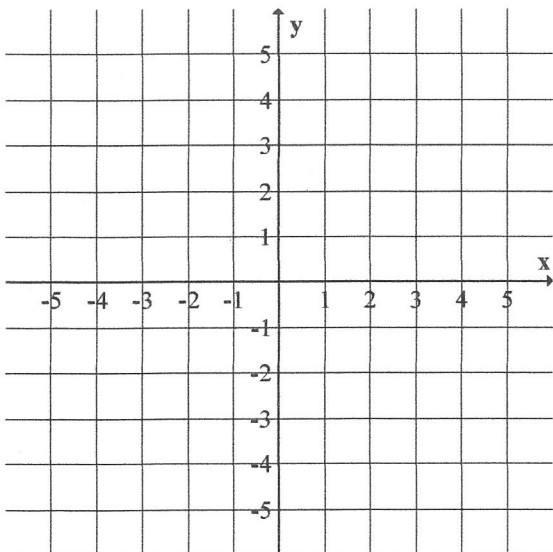
6. $f(x) = 3^x$



$f(x) =$

$f^{-1}(x) =$

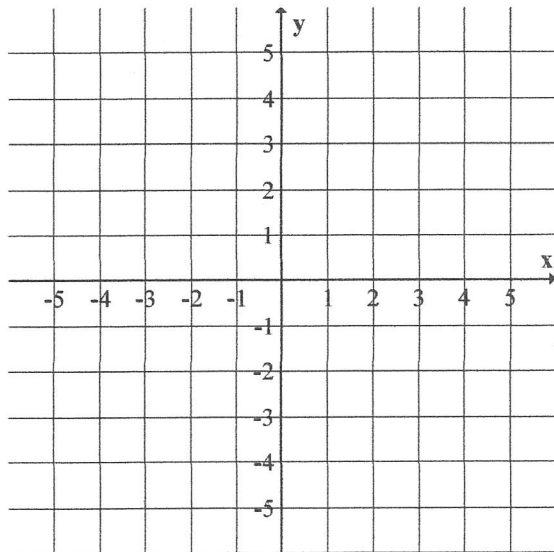
7. $f(x) = \sin^{-1} x$



$f(x) =$

$f^{-1}(x) =$

8. $f(x) = \ln x$



$f(x) =$

$f^{-1}(x) =$

Solve the equation algebraically. Check your solution graphically.

9. $1.045^t = 2$

10. $e^{0.05t} = 3$

11. $e^x + e^{-x} = 3$ (Quad Formula)

Solve for y.

12. $\ln(y-1) - \ln 2 = x + \ln x$

Give the measure of the angle in radians and degrees. Give exact answers whenever possible.

1. $\sin^{-1}(0.5)$

radians: _____

degrees: _____

2. $\sin^{-1}\left(-\frac{1}{\sqrt{2}}\right)$

radians: _____

degrees: _____

3. $\tan^{-1}(-5)$

radians: _____

degrees: _____

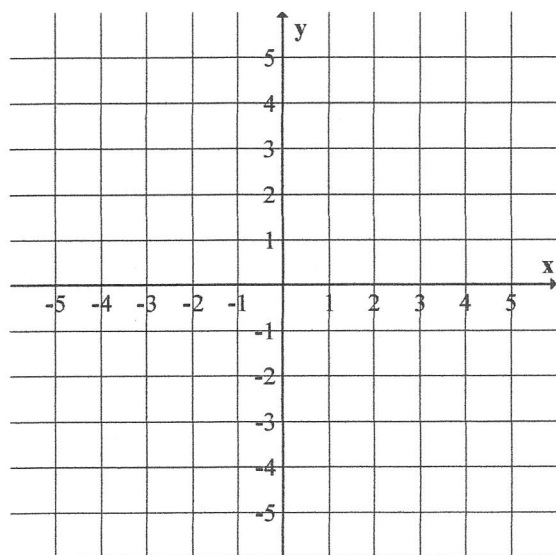
4. $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$

radians: _____

degrees: _____

Specify the period, the amplitude, and graph the following trigonometric functions.

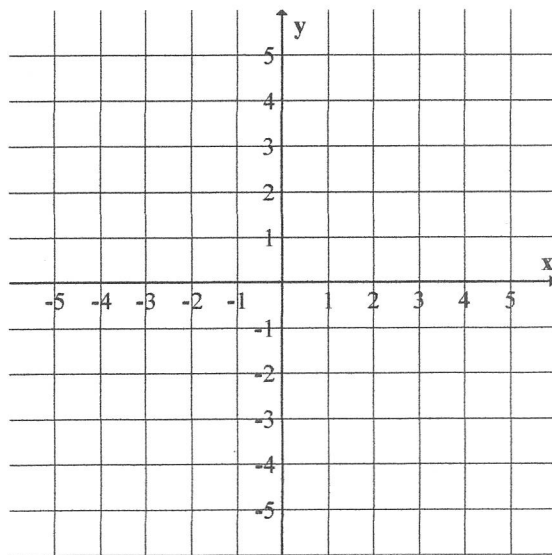
5. $y = 1.5 \sin(2x)$



period: _____

amplitude: _____

6. $y = -3 \cos(2x)$



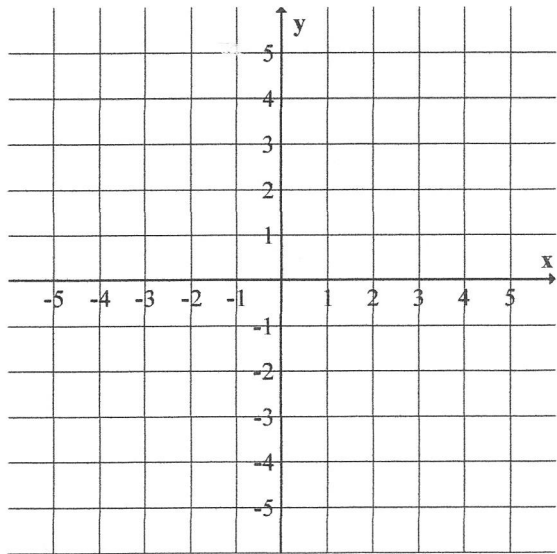
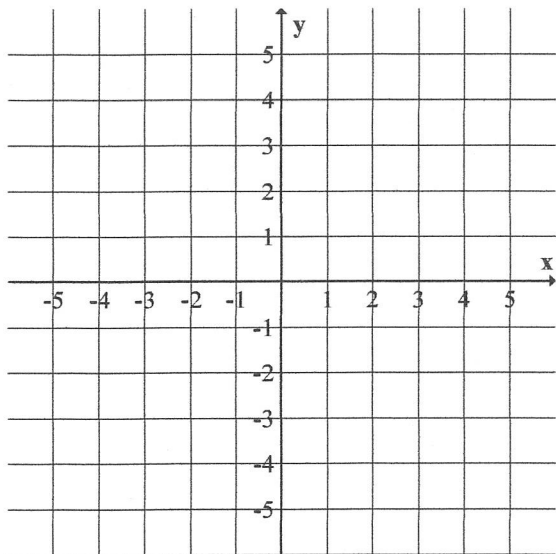
period: _____

amplitude: _____

Specify the period, domain, range, and graph the following trigonometric functions.

7. $y = 3 \csc(3x + \pi) - 2$

8. $y = -\tan(3x + \pi) + 2$



period: _____

period: _____

domain: _____

domain: _____

range: _____

range: _____

Solve the equation in the specified interval.

9. $\cos x = -0.7$, $2\pi \leq x < 4\pi$

10. $\cot x = -1$, $-\infty < x < \infty$

Determine the limit by substitution. Support graphically (quick sketch).

1. $\lim_{x \rightarrow 1/2} 3x^2(2x-1)$

2. $\lim_{x \rightarrow -4} (x+3)^{1998}$

3. $\lim_{x \rightarrow 1} (x^3 + 3x^2 - 2x - 17)$

4. $\lim_{x \rightarrow 2} \frac{x^2 + 5x + 6}{x + 2}$

5. $\lim_{y \rightarrow -3} \frac{y^2 + 4y + 3}{y^2 - 3}$

6. $\lim_{x \rightarrow \pi/2} \ln(\sin(x))$

Explain why you cannot use substitution to find the limit. Find the limit if it exists.

7. $\lim_{x \rightarrow -2} \sqrt{x-2}$

8. $\lim_{x \rightarrow 0} \frac{1}{x^2}$

9. $\lim_{x \rightarrow 0} \frac{|x|}{x}$

10. $\lim_{x \rightarrow 0} \frac{(4+x)^2 - 16}{x}$

Determine the limit graphically, confirm algebraically.

11. $\lim_{x \rightarrow 2} \frac{x^2 - 3x + 2}{x^2 - 4}$

12. $\lim_{x \rightarrow 0} \frac{\frac{1}{2+x} - \frac{1}{2}}{x}$

13. $\lim_{x \rightarrow 0} \frac{\sin(2x)}{x}$

14. $\lim_{x \rightarrow 0} \frac{\sin x}{2x^2 - x}$

Given the graph to the right, find the following limits.

14.

$\lim_{x \rightarrow -1^+} f(x) =$

$\lim_{x \rightarrow -1^-} f(x) =$

$\lim_{x \rightarrow -1} f(x) =$

$\lim_{x \rightarrow 0^+} f(x) =$

$\lim_{x \rightarrow 0^-} f(x) =$

$\lim_{x \rightarrow 0} f(x) =$

$\lim_{x \rightarrow 2^-} f(x) =$

$\lim_{x \rightarrow 2^+} f(x) =$

