

Write an equation for the specified line.

1. through (1,-6) with slope 3
2. through (-1,2) with slope -1/2
3. the vertical line through (0,3)
4. through (-3,6) and (1,-2)
5. the horizontal line through (0,2)
6. through (3,3) and (-2,5)
7. with slope -3 and y-intercept 3
8. through (3,1) and parallel to  $2x - y = -2$
9. through (4,-12) and parallel to  $4x + 3y = 12$
10. through (-2,-3) and perpendicular to  $3x - 5y = 1$
11. through (-1,2) and perpendicular to  $1/2x + 1/3y = 1$
12. with x-intercept 3 and y-intercept -5
13. the line  $y = f(x)$  where f has the following values
14. through (4,-2) with x-intercept -3

X	-2	2	4
F(x)	4	2	1

Determine whether the graph of the function is symmetric about the y-axis, the origin or neither.

15.  $y = x^{\frac{1}{5}}$
16.  $y = x^{\frac{2}{5}}$
17.  $y = x^2 - 2x - 1$
18.  $y = e^{-x^2}$

Determine whether the function is even, odd, or neither.

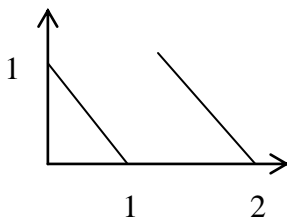
19.  $y = x^2 + 1$
20.  $y = x^5 - x^3 - x$
21.  $y = 1 - \cos x$
22.  $y = \sec x \tan x$
23.  $y = \frac{x^4 + 1}{x^3 - 2x}$
24.  $y = 1 - \sin x$
25.  $y = x + \cos x$
26.  $y = \sqrt{x^4 - 1}$

Find the a) domain, b) range, and c) graph the function.

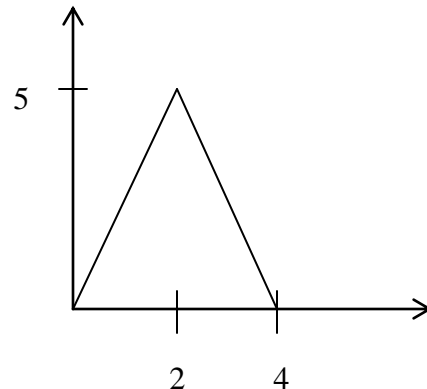
27.  $y = |x| - 2$
28.  $y = -2 + \sqrt{1-x}$
29.  $y = \sqrt{16-x^2}$
30.  $y = 3^{2-x} + 1$
31.  $y = 2e^{-x} - 3$
32.  $y = \tan(2x - \pi)$
33.  $y = 2 \sin(3x + \pi) - 1$
34.  $y = x^{\frac{2}{5}}$
35.  $y = \ln(x-3) + 1$
36.  $y = -1 + \sqrt[3]{2-x}$
37.  $y = \begin{cases} \sqrt{-x} & -4 \leq x \leq 0 \\ \sqrt{x} & 0 < x \leq 4 \end{cases}$
38.  $y = \begin{cases} -x-2 & -2 \leq x \leq -1 \\ x & -1 < x \leq 1 \\ -x+2 & 1 < x \leq 2 \end{cases}$

Write a piece-wise formula for the function.

39.



40.





60. Smith Hauling purchased an 18 – wheel truck for \$100,000. The truck depreciates at the constant rate of \$10,000 per year. Write an expression that gives the value  $y$  after  $x$  years. When is the value of the truck \$55,000?
61. A drug is administered intravenously for pain. The function  $f(t) = 90 - 52\ln(1 + t)$ ,  $0 \leq t \leq 4$  gives the number of units of the drug in the body after  $t$  hours. How much is present after 2 hours? Graph the function.
62. If Joenita invests \$1500 in a retirement account that earns 8% compounded annually, how long will it take this single investment to grow to \$5000?
63. The number of guppies in Susan's aquarium doubles every day. There are four guppies initially.
- Write the number of guppies as a function of time.
  - How many guppies were present after 4 days? After one week?
  - When will there be 2000 guppies?

Answers

1.  $y = 3x - 9$       2.  $y = -\frac{1}{2}x + \frac{3}{2}$       3.  $x = 0$       4.  $y = -2x$       5.  $y = 2$   
 6.  $y = -\frac{2}{5}x + \frac{21}{5}$       7.  $y = -3x + 3$       8.  $y = 2x - 5$       9.  $y = -\frac{4}{3}x - \frac{20}{3}$       10.  $y = -\frac{5}{3}x - \frac{19}{3}$   
 11.  $y = \frac{2}{3}x + \frac{8}{3}$       12.  $y = \frac{5}{3}x - 5$       13.  $y = -\frac{1}{2}x + 3$       14.  $y = -\frac{2}{7}x - \frac{6}{7}$   
 15. origin      16. y-axis      17. neither      18. y-axis  
 19. even      20. odd      21. even      22. odd      23. odd  
 24. neither      25. neither      26. even

	27.	28.	29.	30.	31.	32.	33.	34.	35.	36.	37.	38.
Domain	real	$(-\infty, 1]$	$[-4, 4]$	real	real	$x \neq \frac{k\pi}{4}, \text{ odd } k$	real	real	$(3, \infty)$	real	$[-4, 4]$	$[-2, 2]$
Range	$[-2, \infty)$	$[-2, \infty)$	$[0, 4]$	$(1, \infty)$	$(-3, \infty)$	real	$[-3, 1]$	$[0, \infty)$	real	real	$[0, 2]$	$[-1, 1]$

39.  $f(x) = \begin{cases} 1-x & 0 \leq x < 1 \\ 2-x & 1 \leq x \leq 2 \end{cases}$       40.  $f(x) = \begin{cases} \frac{5x}{2} & 0 \leq x < 2 \\ -\frac{5}{2}x + 10 & 2 \leq x \leq 4 \end{cases}$

	$(f \circ g)(-1)$	$(g \circ f)(2)$	$(f \circ f)(x)$	$(g \circ g)(x)$
41.	1	$\frac{\sqrt{10}}{5}$	$x, x \neq 0$	$\frac{1}{\sqrt{\sqrt{x+2}+2}}$
42.	2	1	$x$	$\sqrt[3]{\sqrt{x+1}+1}$

43.  $(f \circ g)(x) = -x, x \leq -2$ ,  $(g \circ f)(x) = \sqrt{4-x^2}$ , domain (fog):  $[-2, \infty)$ , domain (gof):  $[-2, 2]$ , range (fog):  $(-\infty, 2]$ , range (gof):  $[0, 2]$   
 44.  $(f \circ g)(x) = \sqrt[4]{1-x}$ ,  $(g \circ f)(x) = \sqrt{1-\sqrt{x}}$ , domain (fog):  $(-\infty, 1]$ , domain (gof):  $[0, 1]$ , range (fog):  $[0, \infty)$ , range (gof):  $[0, 1]$

	initial point	terminal point	direction	equation	portion of graph
45.	(5,0)	(5,0)	counter clockwise	$\frac{x^2}{25} + \frac{y^2}{1} = 1$	all
46.	(0,4)	(0,-4)	counter clockwise	$x^2 + y^2 = 16$	left half
47.	(4,15)	(-2,3)	down to the left	$y = 2x + 7$	from (4,15) to (-2,3)
48.	none	(3,0)	left to right	$y = \sqrt{6-2x}$	all

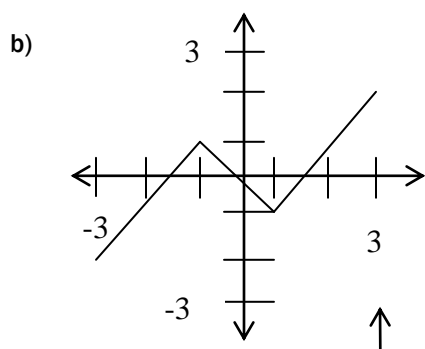
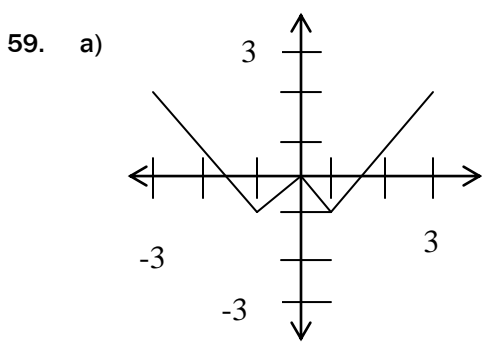
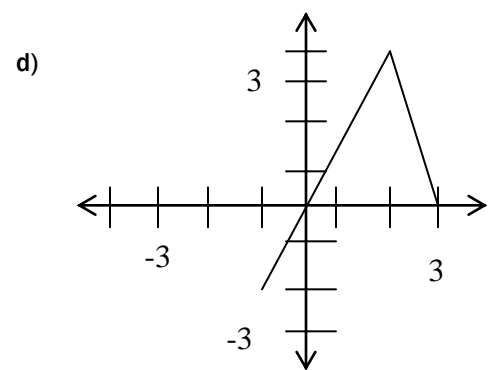
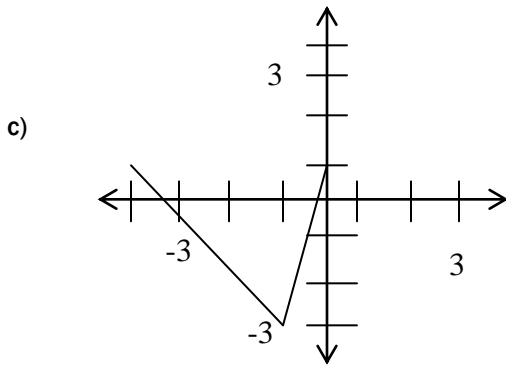
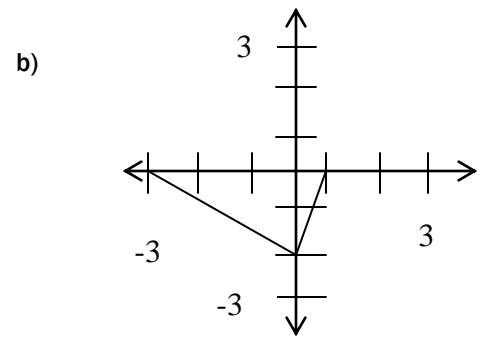
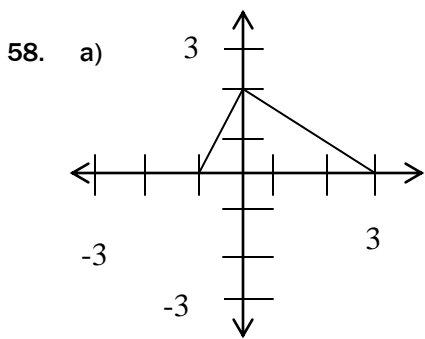
49.  $x = -2 + 6t, y = 5 - 2t, [0, 1]$       50.  $x = -3 + 7t, y = -2 + t, -\infty < t < \infty$   
 51.  $x = 2 - 3t, y = 5 - 5t, 0 \leq t$       52.  $x = t, y = t(t - 4), t \leq 2$

53. 0.6435 radians or 36.8699°      54. -1.1607 radians or -66.5014°

55.  $\cos \theta = \frac{3}{7}, \sin \theta = \frac{\sqrt{40}}{7}, \tan \theta = \frac{\sqrt{40}}{3}, \sec \theta = \frac{7}{3}, \csc \theta = \frac{7\sqrt{40}}{40}, \cot x = \frac{3\sqrt{40}}{40}$

56. a) 3.3430, 6.0818      b)  $3.340 + 2k\pi, 6.0818 + 2k\pi, k$  is any integer

57.  $x = -5 \ln 4$



60. a)  $V = 100000 - 10000x, 0 \leq x \leq 10$       b) 4.5 years

61. a) 90 units      b)  $90 - 52 \ln 3 \approx 32.8722$  units

62.  $t = \frac{\ln(\frac{10}{3})}{\ln 1.08} \approx 15.6439$ , if interest is paid at the end of the year it will take 16 years

63. a)  $N = 4 \cdot 2^t$       b) 64,512      c)  $\frac{\ln 500}{\ln 2} \approx 8.9658$  days

