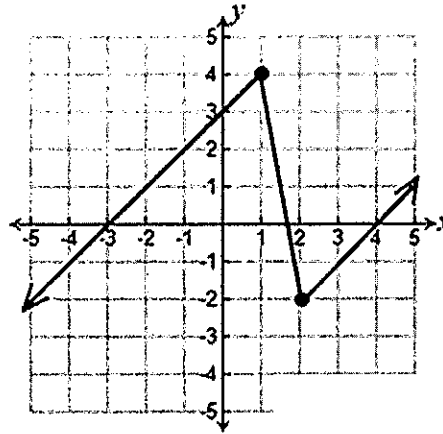


1. Which of the function definitions shown below will produce the graph below?



a) $r(x) = \begin{cases} x+3; & -\infty < x < 1 \\ -3x+5; & 1 \leq x \leq 2 \\ x+4; & 2 < x < \infty \end{cases}$

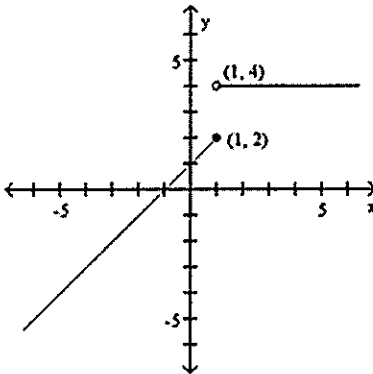
b) $g(x) = \begin{cases} x-3; & -\infty < x < 1 \\ 6x+10; & 1 \leq x \leq 2 \\ x+4; & 2 < x < \infty \end{cases}$

c) $f(x) = \begin{cases} x+3; & -\infty < x < 1 \\ -6x+10; & 1 \leq x \leq 2 \\ x-4; & 2 < x < \infty \end{cases}$

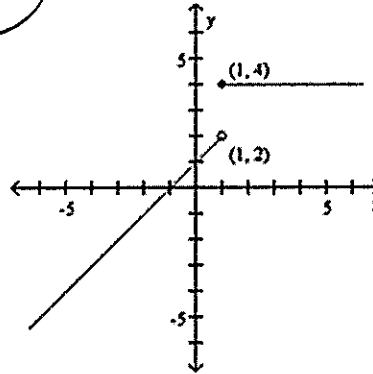
d) $h(x) = \begin{cases} -x+3; & -\infty < x < 1 \\ 3x+5; & 1 \leq x \leq 2 \\ -x+4; & 2 < x < \infty \end{cases}$

2. Given the equation $f(x) = \begin{cases} x+1, & \text{if } x < 1 \\ 4, & \text{if } x \geq 1 \end{cases}$, determine its graph.

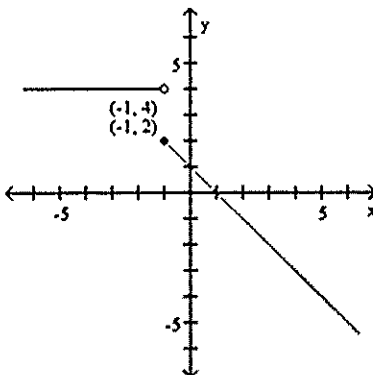
A)



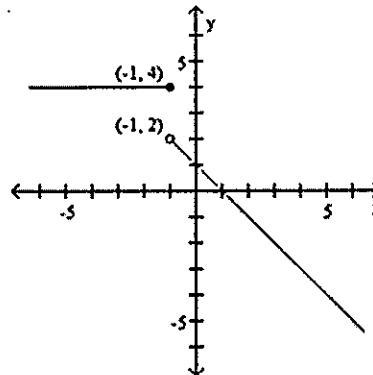
B)



C)



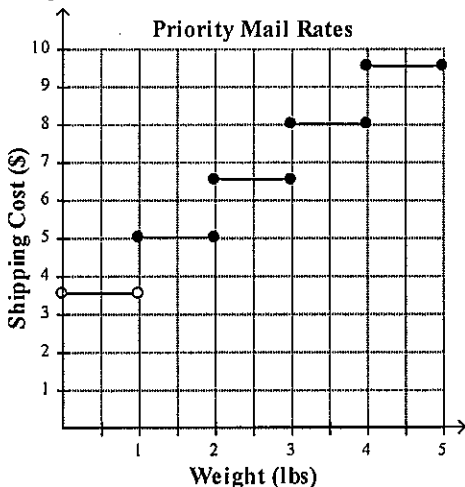
D)



3. A shipping company charges \$3.50 to ship a package weighing one pound or less. Then they charge \$1.50 for each additional pound, or fraction of a pound, up to five pounds. Write a piecewise function that gives the price P for shipping a package weighing w pounds. Graph the function.

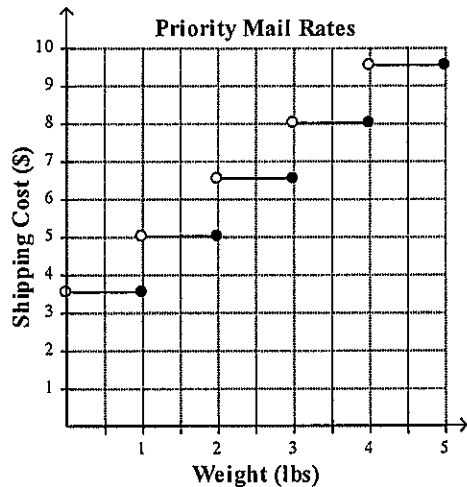
a.

$$P = \begin{cases} 3.5, & \text{if } 0 < x < 1 \\ 5, & \text{if } 1 \leq x \leq 2 \\ 6.5, & \text{if } 2 \leq x \leq 3 \\ 8, & \text{if } 3 \leq x \leq 4 \\ 9.5, & \text{if } 4 \leq x \leq 5 \end{cases}$$



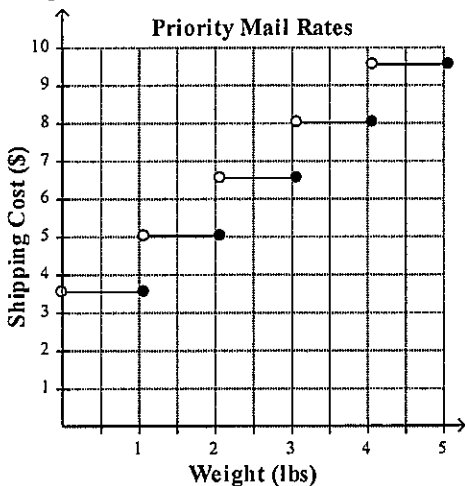
c.

$$P = \begin{cases} 3.5, & \text{if } 0 < x \leq 1 \\ 5, & \text{if } 1 < x \leq 2 \\ 6.5, & \text{if } 2 < x \leq 3 \\ 8, & \text{if } 3 < x \leq 4 \\ 9.5, & \text{if } 4 < x \leq 5 \end{cases}$$



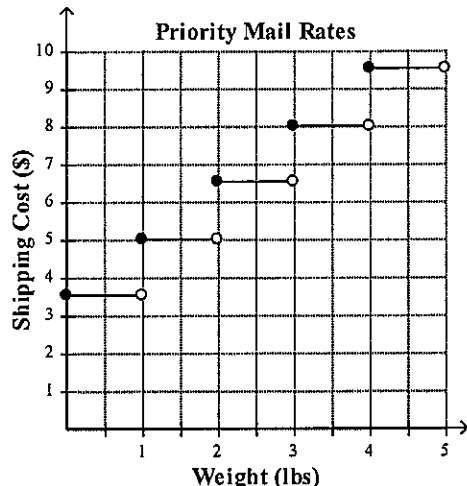
b.

$$P = \begin{cases} 3.5, & \text{if } 0 < x \leq 1.1 \\ 5, & \text{if } 1.1 < x \leq 2.1 \\ 6.5, & \text{if } 2.1 < x \leq 3.1 \\ 8, & \text{if } 3.1 < x \leq 4.1 \\ 9.5, & \text{if } 4.1 < x \leq 5.1 \end{cases}$$



d.

$$P = \begin{cases} 3.5, & \text{if } 0 \leq x < 1 \\ 5, & \text{if } 1 \leq x < 2 \\ 6.5, & \text{if } 2 \leq x < 3 \\ 8, & \text{if } 3 \leq x < 4 \\ 9.5, & \text{if } 4 \leq x < 5 \end{cases}$$



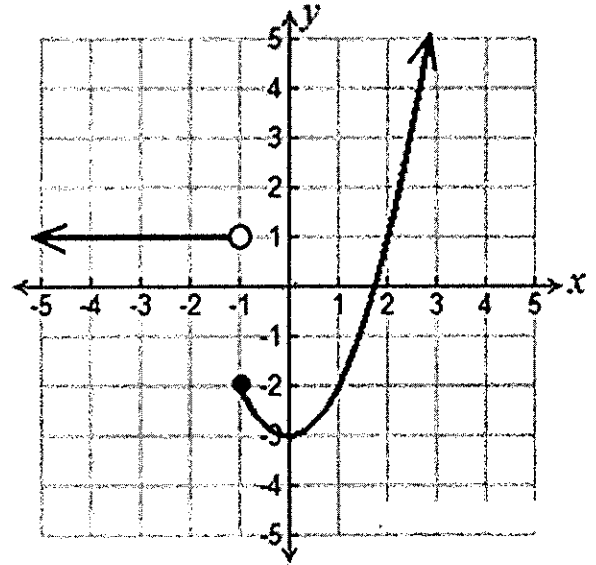
Use the graph below to answer questions #'s 4-7.

4. What is the domain in set builder notation?

$$\{ -\infty < x < \infty \}$$

5. What is the range in set builder notation?

$$\{ -3 \leq y < \infty \}$$



6. Which function definition will produce this graph?

a) $r(x) = \begin{cases} -1; & -\infty < x < -1 \\ x^2 - 3; & -1 \leq x < \infty \end{cases}$

c) $g(x) = \begin{cases} 1; & -\infty < x < -1 \\ x^2 - 3; & -1 \leq x < \infty \end{cases}$

b) $f(x) = \begin{cases} x^2 - 3; & -\infty < x < -1 \\ 1; & -1 \leq x < \infty \end{cases}$

d) $s(x) = \begin{cases} 1; & -\infty < x < -1 \\ x^2 + 3; & -1 \leq x < \infty \end{cases}$

d) $f(x) = -3$
0

7. Find:

a. $f(-1)$

-2

b. $f(1)$

-2

c. $f(0)$

-3

e) $f(x) = -2$

±1

8. Evaluate the function for the given value of x.

$$f(x) = \begin{cases} 3, & \text{if } x \leq 0 \\ 2, & \text{if } x > 0 \end{cases}$$

$$g(x) = \begin{cases} x + 5, & \text{if } x \leq 3 \\ 2x - 1, & \text{if } x > 3 \end{cases}$$

$$h(x) = \begin{cases} \frac{1}{2}x - 4, & \text{if } x \leq -2 \\ 3 - 2x, & \text{if } x > -2 \end{cases}$$

a. $f(2) = 2$
 $2 > 0$

b. $f(-2) = 3$

c. $f(0) = 3$

d. $f(\frac{1}{2}) = 2$

e. $g(7) = 13$
 $2(7) - 1$
 $14 - 1 = 13$

f. $g(0) = 5$
 $0 + 5 = 5$

g. $g(-1) = 4$
 $-1 + 5 = 4$

h. $g(3) = 8$
 $3 + 5 = 8$

i. $h(-4) = -6$
 $\frac{1}{2}(-4) - 4$

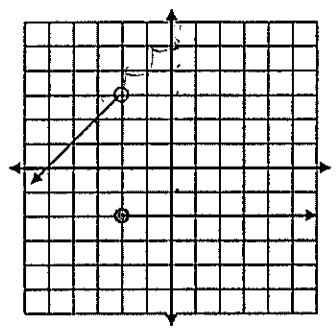
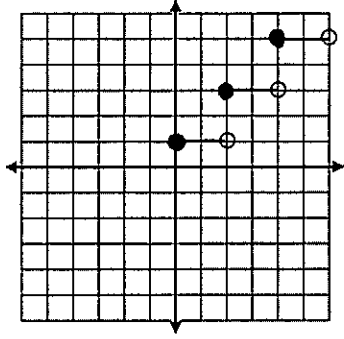
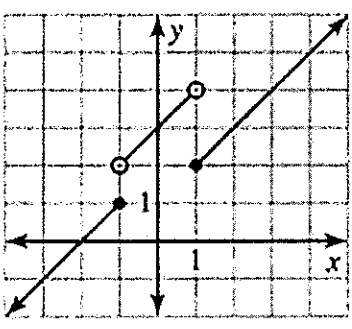
j. $h(-2) = -5$
 $\frac{1}{2}(-2) - 4$

k. $h(-1) = 5$
 $3 - 2(-1)$
 $3 + 2 = 5$

l. $h(6) = -9$
 $3 - 12 = -9$

(equation with restrictions)

9. State the piecewise function for each graph.



$$f(x) = \begin{cases} x+2, & \text{if } x \leq -1 \\ x+3, & \text{if } -1 < x < 1 \\ x+1, & \text{if } x \geq 1 \end{cases}$$

$$f(x) = \begin{cases} 1, & \text{if } 0 \leq x < 2 \\ 3, & \text{if } 2 \leq x < 4 \\ 5, & \text{if } 4 \leq x < 6 \end{cases}$$

$$f(x) = \begin{cases} -2, & \text{if } x \geq -1 \\ x+5, & \text{if } x < -1 \end{cases}$$

Graph each of the following.

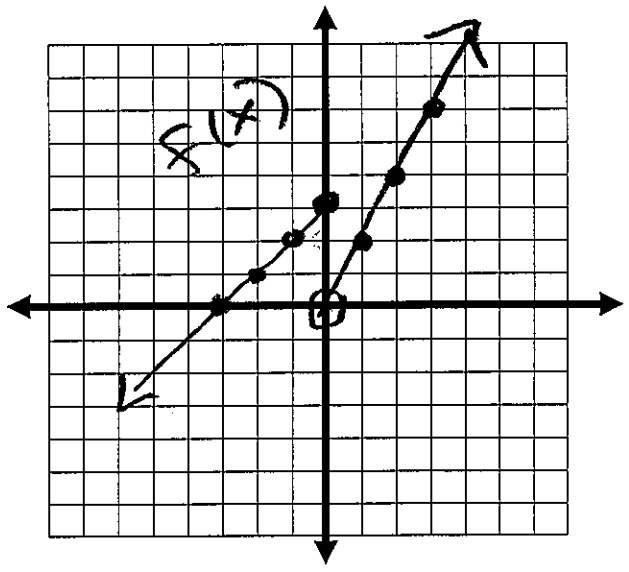
10. $f(x) = \begin{cases} x+3, & \text{if } x \leq 0 \\ 2x, & \text{if } x > 0 \end{cases}$

$y = x + 3$

x	y
0	3
-1	2
-2	1
-3	0

$y = 2x$

x	y
0	0
1	2
2	4
3	6



11. $f(x) = \begin{cases} x+1, & \text{if } x < 0 \\ -x+1, & \text{if } 0 \leq x \leq 2 \\ x-1, & \text{if } x > 2 \end{cases}$

$y = x + 1$

x	y
0	1
-1	0
-2	-1
-3	-2

$y = -x + 1$

x	y
0	1
1	0
2	-1

$y = x - 1$

x	y
2	1
3	2
4	3
5	4

