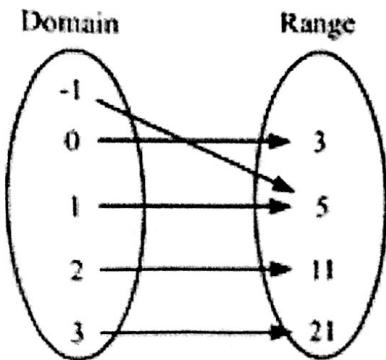## Unit 2 Review – Secondary 1 Honors

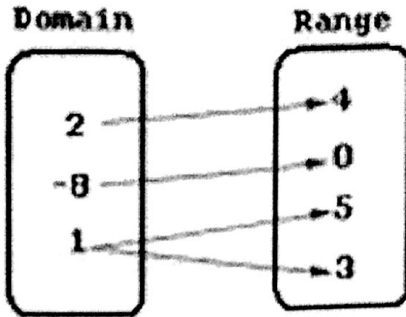**Determine whether the following is a function. Explain why or why not?**
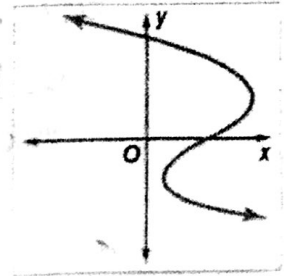
1.

Domain   Range

Yes. Each element in the domain maps to 1 element of the range.

2.

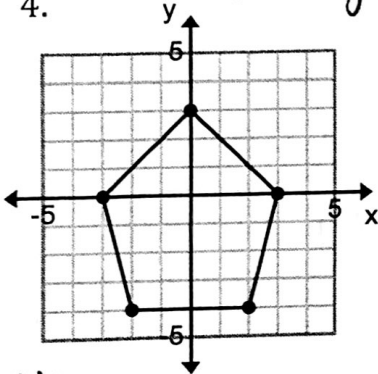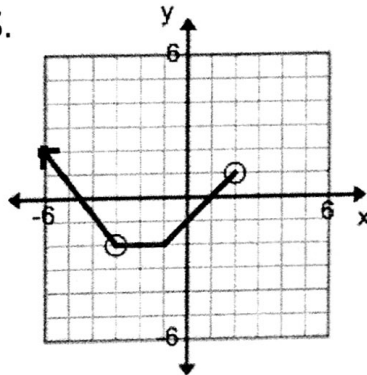Domain   Range

No. 1 maps to 5 & 3.

3.

No. Fails the vertical Line Test. (VLT)

4.

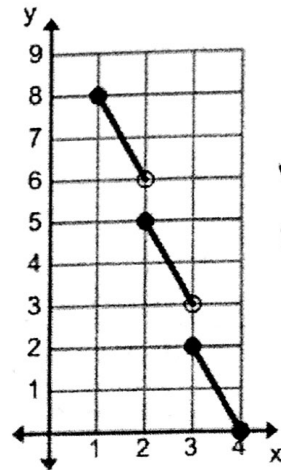NO.
Fails VLT.

5.

Yes. Passes VLT

6.

Yes. Passes VLT.

Determine if each set of ordered pairs is a function or not, then state the domain and range.

7. $\{(-4,3),(5,3),(-2,1),(-7,1)\}$

Yes Domain: $\{-7,-4,-2,5\}$

Range: $\{1,3\}$

8. $\{(-3,2),(4,5),(-3,7),(4,-9),(5,-3)\}$

NO Domain: $\{-3,4,5\}$

Range: $\{-9,-3,2,5,7\}$

Find the average rate of change for the given interval.

9. on the interval $[3,6]$

6

x	f(x)
0	2
1	-3
2	0
3	2
4	6
5	12
6	20

10. on the interval $[6,8]$

-4

n	f(n)
6	23
7	19
8	15
9	11

Determine whether the following is a function. Explain why or why not?

11.   12.   13. $f(x) = 2x - 9$

x	$f(x)$
-3	6
2	9
-4	3
2	9

Yes. each input has 1 output.

x	$f(x)$
-5	9
-2	1
4	3
1	1

Yes. every x has only 1 y.

Yes. Each input has 1 output.

Use $f(x) = 3x - 4$, $g(x) = x^2 + 5$, & $h(x) = -5x + 3$ to answer questions 14-23.

14. $f(x) + g(x)$

$x^2 + 3x + 1$

15. $f(-5) = -19$

16. $g(-5) = 30$

17. $f(x) \cdot h(x)$

$-15x^2 + 29x - 12$

18. $f(2) - h(-3) = -16$

19. $f(7) - 3 = 14$

20. $g(4) + 7 = 28$

21. $3 + f(2) = 5$

22. $g(-5) - 3 = 27$

23. For what x values does $f(x) = h(x)$

$x = 7/8$

Use $f(x) = -7x + 6$ & $g(x) = 2x + 4$ to answer questions 24-28.

24. $f(x) = -36$

$f(6) = -36$

25. $g(7) = 18$

26. $f(5) = -29$

27. $g(0) = 4$

28. $g(x) = 28$

$g(12) = 28$

Use the table to answer questions 29-32.

x	f(x)
-1	8
2	0
3	8
-2	-1
0	-2
4	2

29. $f(-2)$

$f(-2) = -1$

30. $f(x) = -2$

$f(0) = -2$

31. $f(x) = 8$

$f(-1) = 8$
$f(3) = 8$

32. $f(2) = 0$

Use the graph to the right to answer questions 33-37.

33. $f(2) = -3$

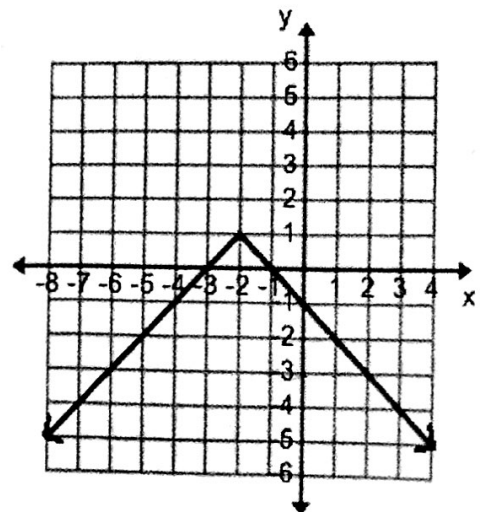34. $f(x) = 0$

$f(-1) = 0$
$f(-3) = 0$

35. $f(-4) = -1$

36. $f(x) = 1$

$f(-2) = 1$

37. $f(x) = -3$

$f(2) = -3$
$f(-6) = -3$

38. Describe the features of the graph **below** using **SET BUILDER** notation

Is this a function? __Yes__ Why? __passes VLT__

Domain: $x \leq -1$ or $x \geq 1$ Range: $y \geq -4$

Continuity: (Circle one)   Continuous   ⟨Non-Continuous⟩   Discrete

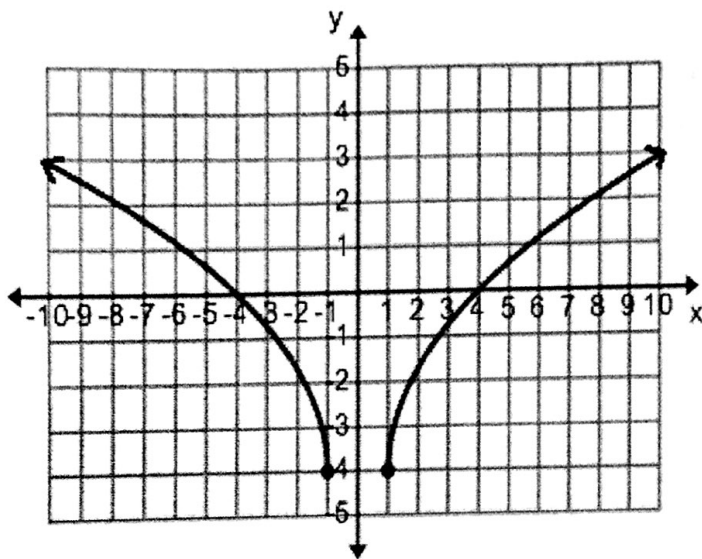Increasing: $x > 1$ Decreasing: $x < -1$

Minimum: $f(-1) = -4$ & $f(1) = -4$ Maximum: __N/A__

Positive: $x < -4$ or $x > 4$ Negative: $-4 < x \leq -1$ $1 \leq x < 4$

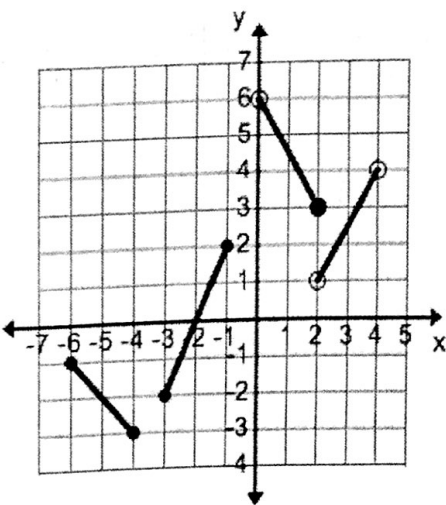x-intercept(s): $f(4) = 0$ $f(-4) = 0$ y-intercept(s): __N/A__

39. Find the average rate of change for the graph on the left on the interval $[1,4]$.

$$\frac{4}{3}$$

40. Describe the features of the graph below using **SET BUILDER** notation

Is this a function? __YES__ Why? __passes VLT__

Domain: $-6 \leq x \leq -4$ $-3 \leq x \leq -1$ $0 < x < 4$

Range: $-3 \leq y < 6$

Continuity: Continuous   ⟨Non-Continuous⟩   Discrete

Increasing: $-3 < x < -1$ $2 < x < 4$

Decreasing: $-6 < x < -4$ $0 < x < 2$

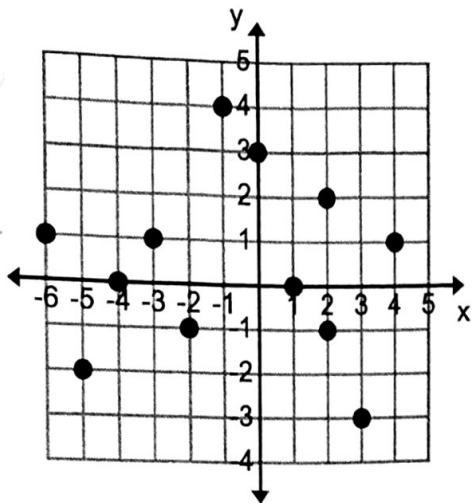Minimum: $f(-4) = -3$ Maximum: Approaches $f(0) = 6$

Positive: $-2 < x \leq -1$ $0 < x < 4$ Negative: $-6 \leq x \leq -4$ $-3 \leq x < -2$

x-intercept(s): $f(-2) = 0$ y-intercept(s): __N/A__

41. Describe the features of the graph below using **SET BUILDER** notation

Is this a function? **NO**   Why? **Fails VLT**

Domain: $\{-6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4\}$

Range: $\{-3, -2, -1, 0, 1, 2, 3, 4\}$

Continuity: Continuous   Non-Continuous   ~~Discrete~~

Increasing: **N/A**

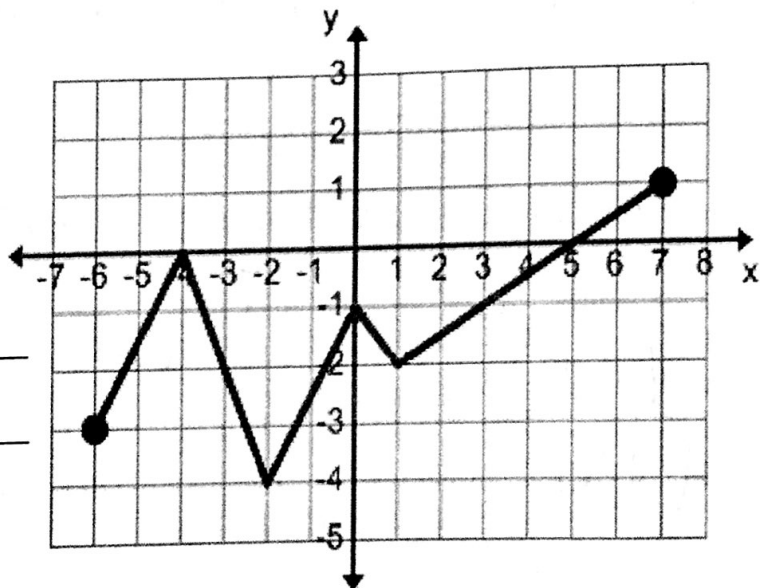Decreasing: **N/A**

Minimum: **$f(3) = -3$**   Maximum: **$f(-1) = 4$**

Positive: $\{-6, -3, -1, 0, 2, 4\}$ Negative: $\{-5, -2, 2, 3\}$

x-intercept(s): **$f(-4) = 0$**   y-intercept(s): **$f(0) = 3$**
$f(1) = 0$

---

42. Describe the features of the function using **INTERVAL NOTATION.**

Is this a function? **YES**

Domain: $[-6, 7]$

Range: $[-4, 1]$

Continuity: ~~Continuous~~   Non-Continuous   Discrete

Increasing: $(-6, -4) \ (-2, 0) \ (1, 7)$ Decreasing: $(-4, -2) \ (0, 1)$

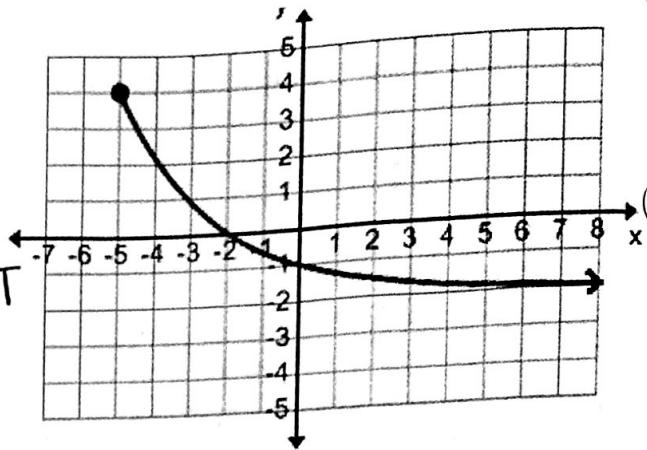Minimum: **$f(-2) = -4$**   Maximum: **$f(7) = 1$**

Positive: $(5, 7]$ Negative: $[-6, -4) \ (-4, 5)$

x-intercept(s): **$f(-4) = 0$**   y-intercept(s): **$f(0) = -1$**
$f(5) = 0$

43.

Describe the features of the function using **INTERVAL NOTATION.**

Is this a function?___YES___ Why? Passes VLT

Domain: $[-5, \infty)$

Range: $(-\infty, 4]$

Continuity: (Continuous)   Non-Continuous   Discrete

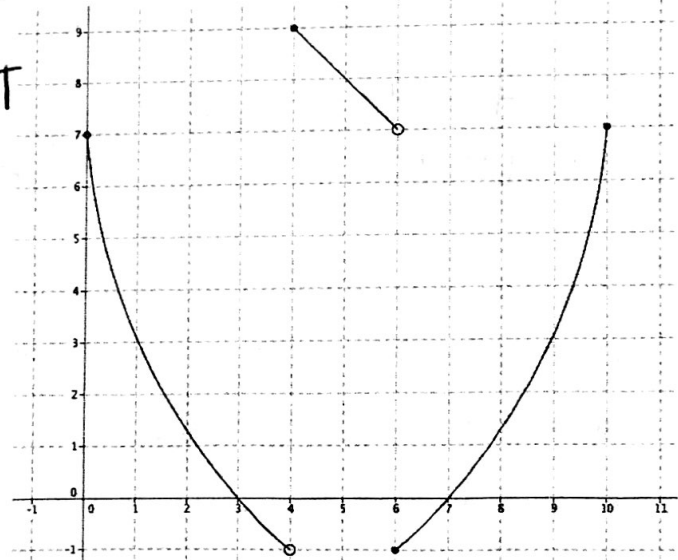Increasing: N/A   Decreasing: $(-5, \infty)$

Minimum: N/A   Maximum: $f(-5) = 4$

Positive: $[-5, -2)$ Negative: $(-2, \infty)$

x-intercept(s): $f(-2) = 0$ y-intercept(s): $f(0) = -1$

44. Find the average rate of change for the graph above on the interval $[-5, -2]$. $\boxed{-\dfrac{4}{3}}$

45. Describe the features of the function using **INTERVAL NOTATION**

Is this a function?___YES___ Why? Passes VLT

Domain: $[0, 10]$

Range: $[-1, 9]$

Continuity: Continuous
              (Non-Continuous)
               Discrete

Increasing: $(6, 10)$

Decreasing: $(0, 4)$ $(4, 6)$

Minimum: $f(6) = -1$ Maximum: $f(4) = 9$

Positive: $[0, 3) [4, 6) (7, 10]$ Negative: $(3, 4) [6, 7)$

x-intercept(s): $f(3) = 0$ $f(7) = 0$ y-intercept(s): $f(0) = 7$

46. Describe the features of the function using **INTERVAL NOTATION**
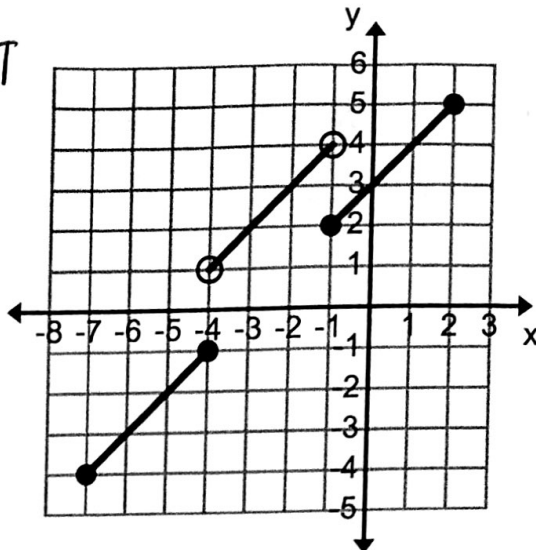
Is this a function? __YES__ Why? __Passes VLT__

Domain: $[-7, 2]$

Range: $[-4, -1] \ (1, 5]$

Continuity: Continuous
~~Non-Continuous~~
Discrete

Increasing: $(-7, -4) \ (-4, -1) \ (-1, 2)$

Decreasing: N/A

Minimum: $f(-7) = -4$ Maximum: $f(2) = 5$

Positive: $(-4, 2]$ Negative: $[-7, -4]$

x-intercept(s): N/A   y-intercept(s): $f(0) = 3$

---

47. Describe the features of the function using **INTERVAL NOTATION**

Is this a function? __yes__ Why? __Passes VLT__

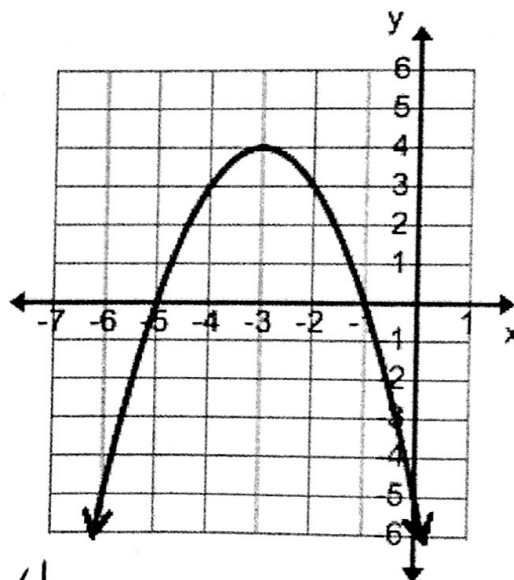Domain: $(-\infty, \infty)$

Range: $(-\infty, 4]$

Continuity: Continuous
Non-Continuous
Discrete

Increasing: $(-\infty, -3)$

Decreasing: $(-3, \infty)$

Minimum: N/A   Maximum: $f(-3) = 4$

Positive: $(-5, -1)$ Negative: $(-\infty, -5) \ (-1, \infty)$

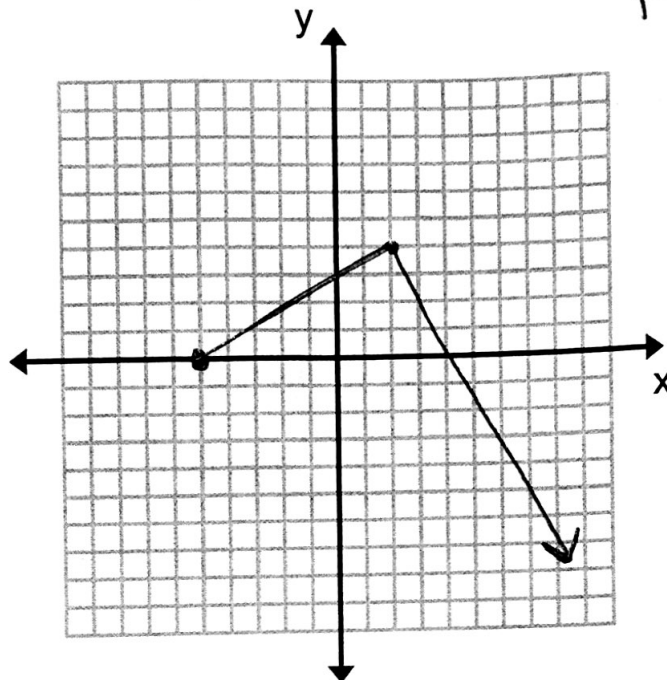x-intercept(s): $f(-5) = 0 \quad f(-1) = 0$ y-intercept(s): $f(0) = -5$

Create a graph that matches the given descriptions: SAMPLE ANSWERS.

There are many possibilities.

48. The function has an intercept at $f(-5)=0$.
　　The function has no minimum.
　　The function increases from -5 to 2 and
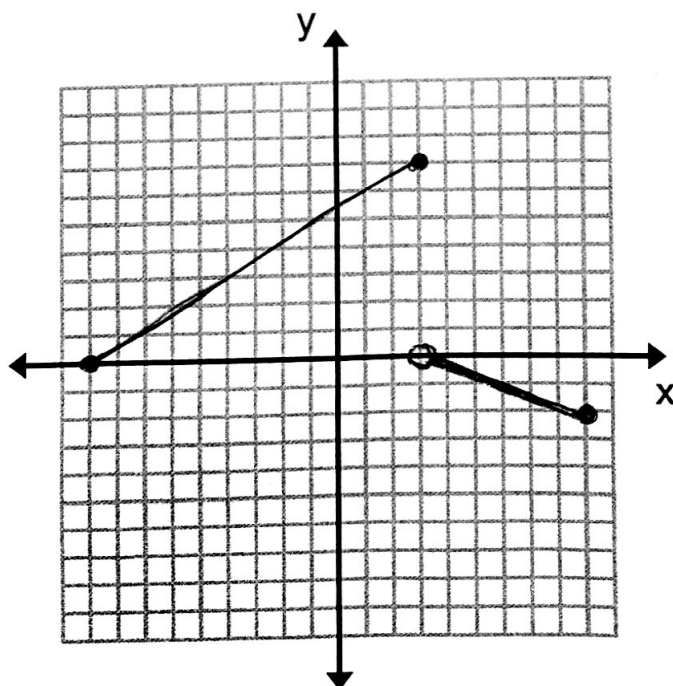　　　　decreases from 2 to infinity.

49. The function has a domain from -9 to 9.
　　The function has a range from -2 to 7
　　The function is non-continuous.
　　The function is positive between -9 to 3.
　　The function is negative from right after 3 to 9.

MATCHING
Match the following descriptions to the graph they BEST represent.

___D___ 50. The domain is 0 to infinity
The range is negative infinity to infinity.
The graph is continuous.

___A___ 51. The domain is from negative infinity to infinity.
The function has a y intercept at f(0)=3
The function never increases and never decreases.
The function is non-continuous.

___E___ 52. The domain is negative infinity to infinity.
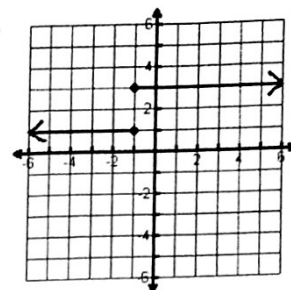The graph is negative from negative infinity to 2.
The graph is always increasing.

___C___ 53. The domain is -3 and 2.
The range is negative infinity to infinity.
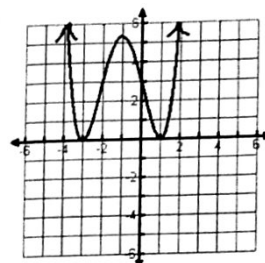The function has no min and no max
The function is non-continuous.

___B___ 54. The domain is negative infinity to infinity.
The range is 0 to infinity.
The function has two increasing intervals.
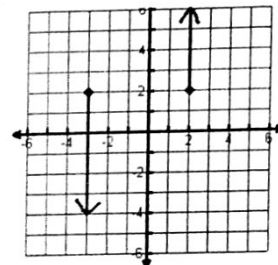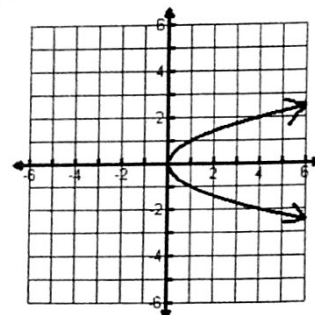The function has minimums at f(-3)=0 and f(1)=0.

A.

B.

C.

D.

E.