

NAME: _____ PERIOD: _____ DATE: _____

Homework Problem Set

1. Suppose a musical piece calls for an orchestra to start at fortissimo (about 90 decibels), decrease in loudness to pianissimo (about 50 decibels) in four measures, and then increase back to fortissimo in another four measures. The sound level s (in decibels) of the musical piece can be modeled by the function $s = 10|m - 4| + 50$ where m is the number of measures.



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Equation source: McDougal Littell

- A. Graph the function.

(Substitute in numbers to help you graph)

$$s = 10|m - 4| + 50$$

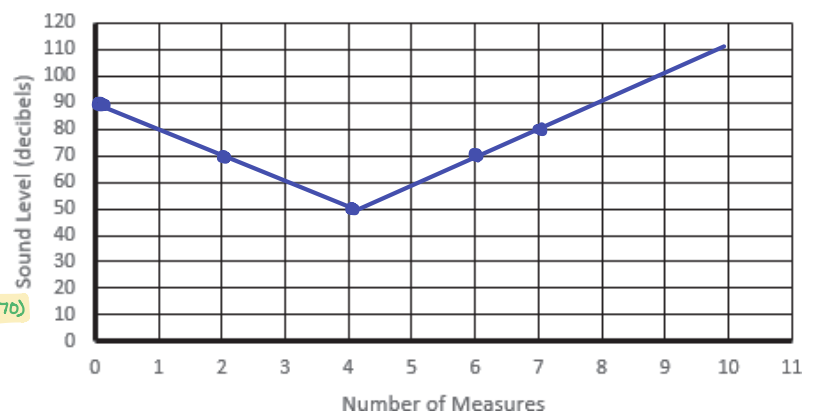
$$\begin{aligned} s &= 10|0 - 4| + 50 \\ 10|-4| + 50 \\ 10(4) + 50 &= 90 \quad (0, 90) \end{aligned}$$

$$\begin{aligned} s &= 10|2 - 4| + 50 \\ 10|-2| + 50 \\ 10(2) + 50 &= 70 \quad (2, 70) \end{aligned}$$

$$\begin{aligned} s &= 10|4 - 4| + 50 \\ &= 10|0| + 50 \\ &= 10(0) + 50 = 50 \quad (4, 50) \end{aligned}$$

$$\begin{aligned} s &= 10|6 - 4| + 50 \\ &= 10|2| + 50 \\ &= 10(2) + 50 = 70 \quad (6, 70) \end{aligned}$$

$$\begin{aligned} s &= 10|7 - 4| + 50 \\ &= 10|3| + 50 \\ 10(3) + 50 &= 80 \quad (7, 80) \end{aligned}$$



- B. After how many measures should the orchestra be at the loudness of mezzo forte (about 70 decibels)?

After 2 measures and at 6 measures.

- C. Determine a reasonable domain and range for this situation.

Answers may slightly vary.

$$D: [0, 8] \quad R: [50, 90]$$

Graph each equation and state the domain, range and vertex.

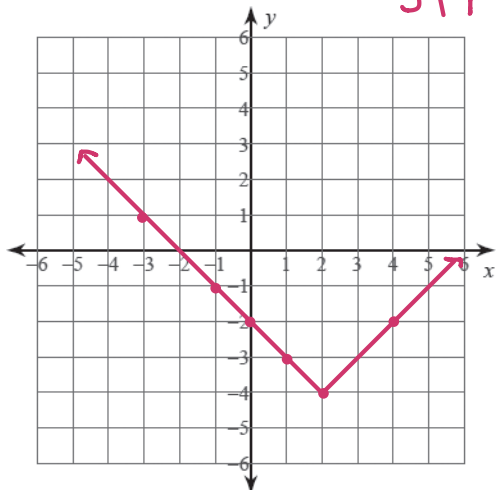
2. $y = |x - 2| - 4$

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

Range: $[-4, \infty)$

Vertex: $(2, -4)$

x	y
4	-2
2	-4
1	-3
0	-2
-1	-1
-3	1



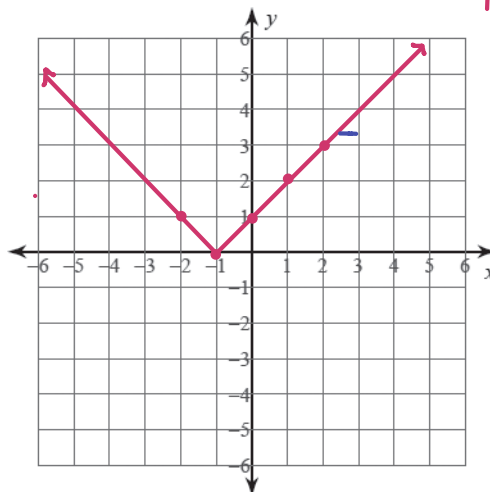
3. $y = |x + 1|$

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

Range: $[0, \infty)$

Vertex: $(-1, 0)$

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



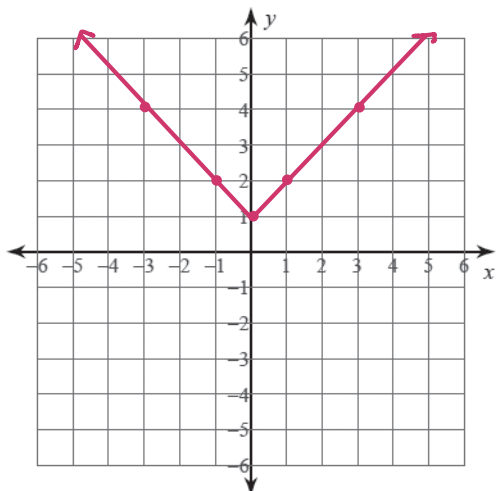
4. $y = |x| + 1$

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

Range: $[1, \infty)$

Vertex: $(0, 1)$

x	y
-3	4
-1	2
0	1
1	2
3	4



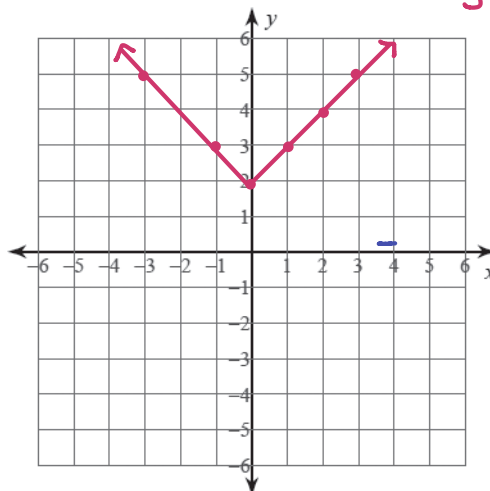
5. $y = |x| + 2$

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

Range: $[2, \infty)$

Vertex: $(0, 2)$

x	y
-3	5
-1	3
0	2
1	3
2	4
3	5



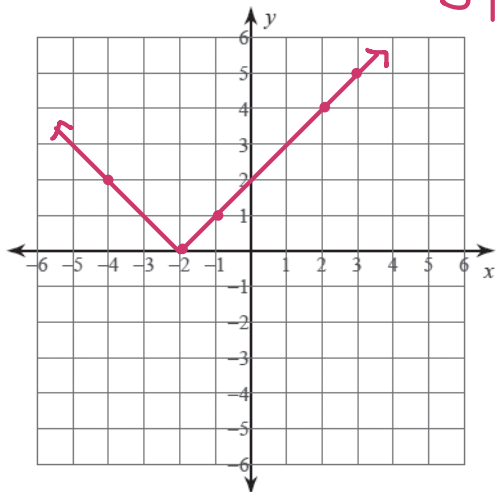
6. $y = |x + 2|$

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

Range: $[0, \infty)$

Vertex: $(-2, 0)$

x	y
-4	2
-2	0
-1	1
2	4
3	5



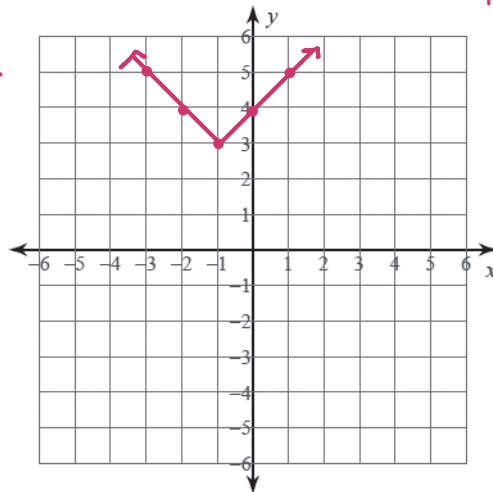
7. $y = |x + 1| + 3$

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

Range: $[3, \infty)$

Vertex: $(-1, 3)$

x	y
-3	5
-2	4
-1	3
0	4
1	5



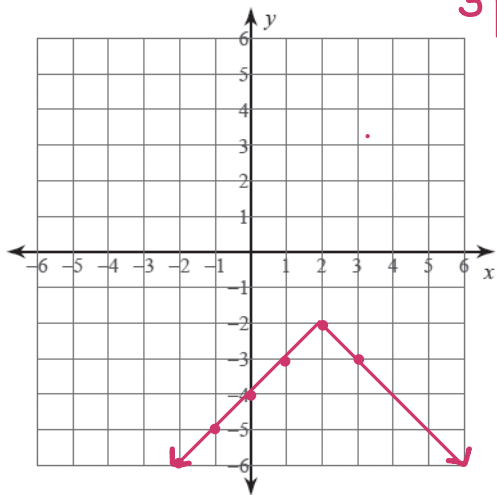
8. $y = -|x - 2| - 2$

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

Range: $(-\infty, -2]$

Vertex: $(2, -2)$

x	y
-2	-6
-1	-5
0	-4
1	-3
2	-2
3	-3



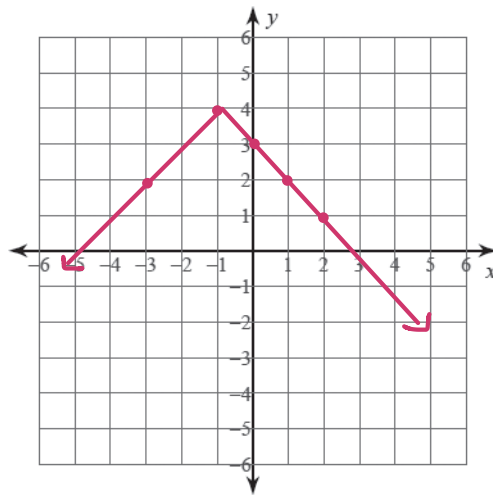
9. $y = -|x + 1| + 4$

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

Range: $(-\infty, 4]$

Vertex: $(-1, 4)$

x	y
-3	2
-1	4
0	3
1	2
2	1



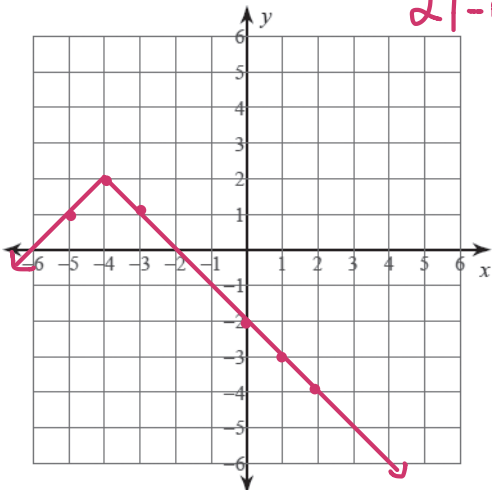
10. $y = -|x + 4| + 2$

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

Range: $(-\infty, 2]$

Vertex: $(-4, 2)$

x	y
-5	1
-4	2
-3	1
0	-2
1	-3
2	-4



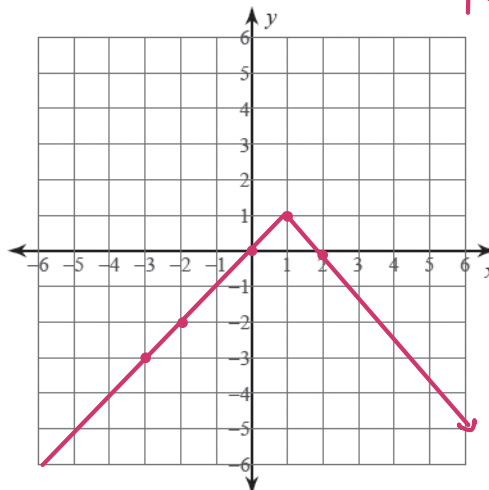
11. $y = -|x - 1| + 1$

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

Range: $(-\infty, 1]$

Vertex: $(1, 1)$

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



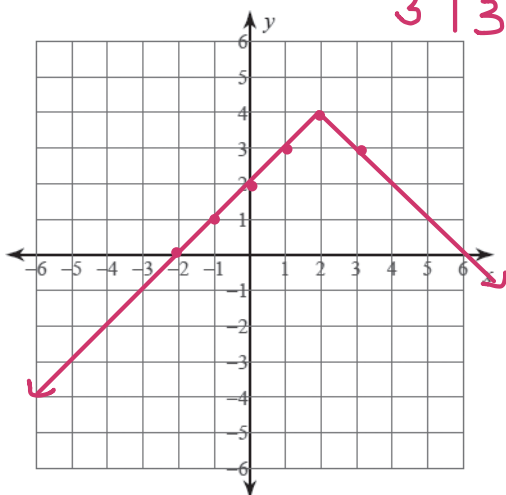
12. $y = -|x - 2| + 4$

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

Range: $(-\infty, 4]$

Vertex: $(2, 4)$

x	y
-2	0
-1	1
0	2
1	3
2	4
3	3
4	2
5	1



13. $y = -|x - 1| - 1$

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

Range: $(-\infty, -1]$

Vertex: $(1, -1)$

x	y
-3	-5
-1	-3
0	-2
1	-1
2	-2

