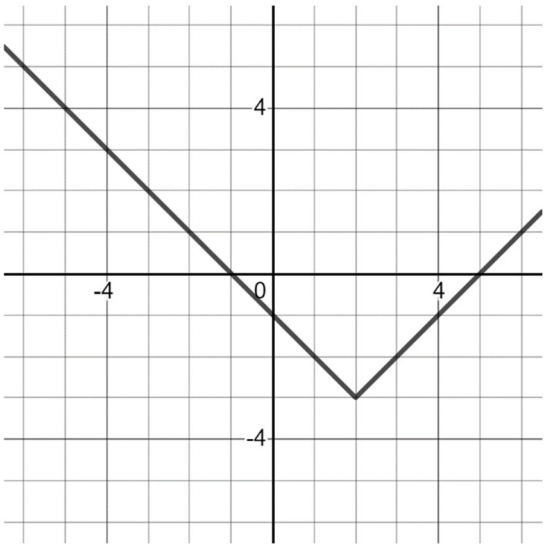
Writing Absolute Value Functions (ALG.ABS.04)

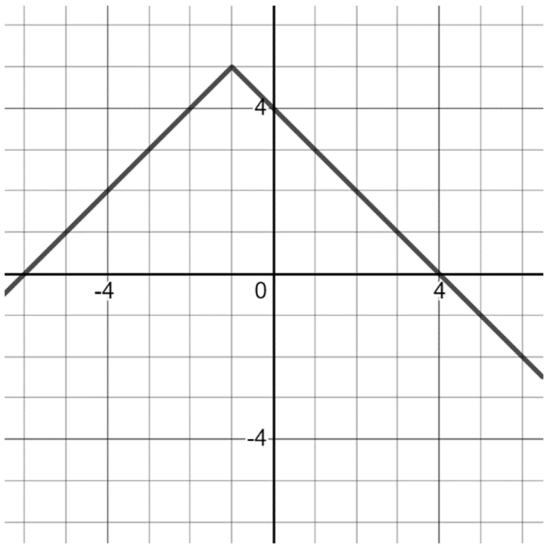
Write an absolute value function for each graph.

1.



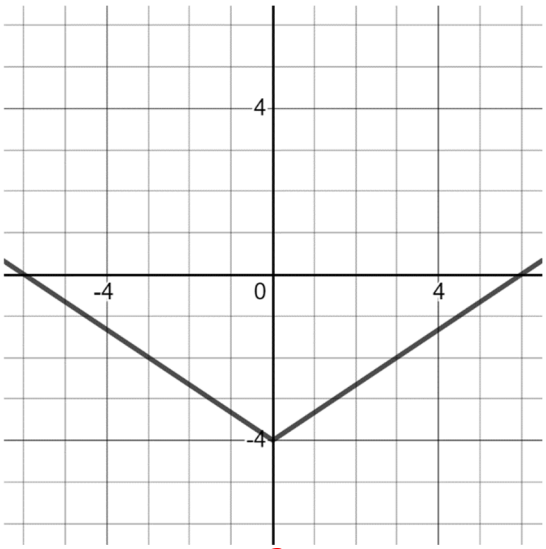
$f(x) = |x - 2| - 3$

2.



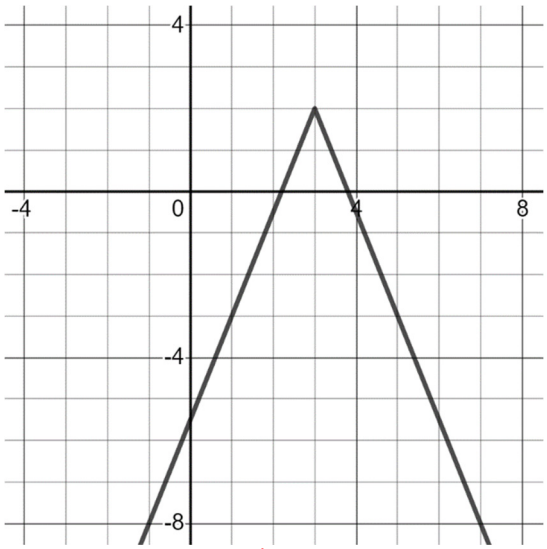
$f(x) = -|x + 1| + 5$

3.



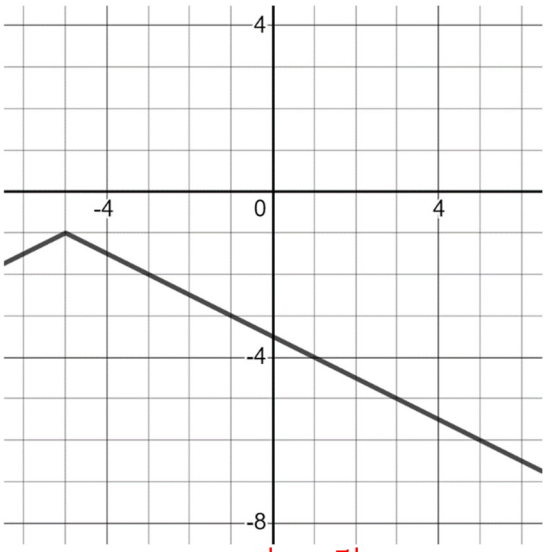
$f(x) = \frac{2}{3}|x| - 4$

4.



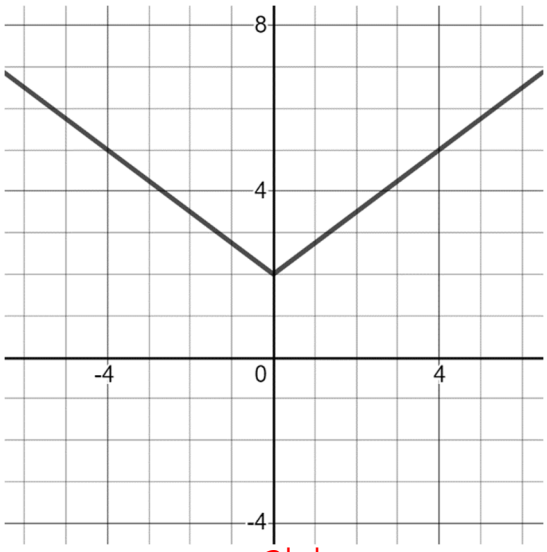
$f(x) = -\frac{5}{2}|x - 3| + 2$

5.



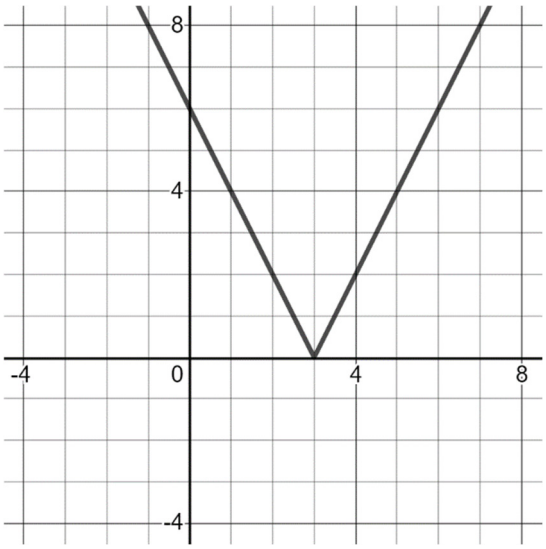
$$f(x) = -\frac{|x+5|}{2} - 1$$

6.



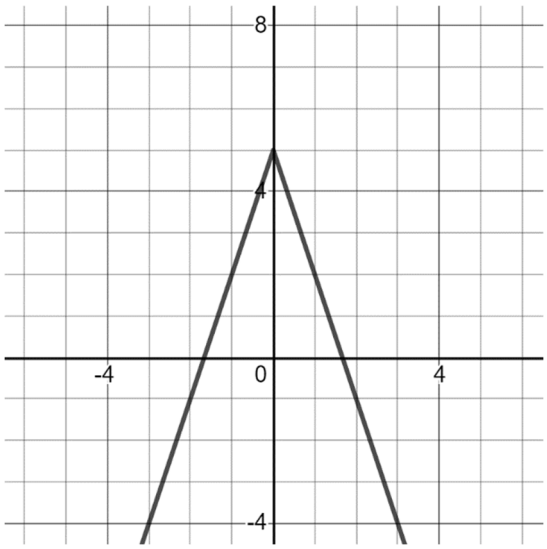
$$f(x) = \frac{3|x|}{4} + 2$$

7.



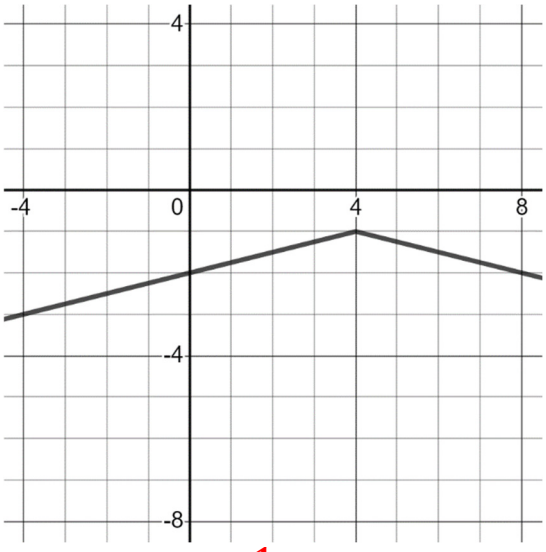
$$f(x) = 2|x-3|$$

8.



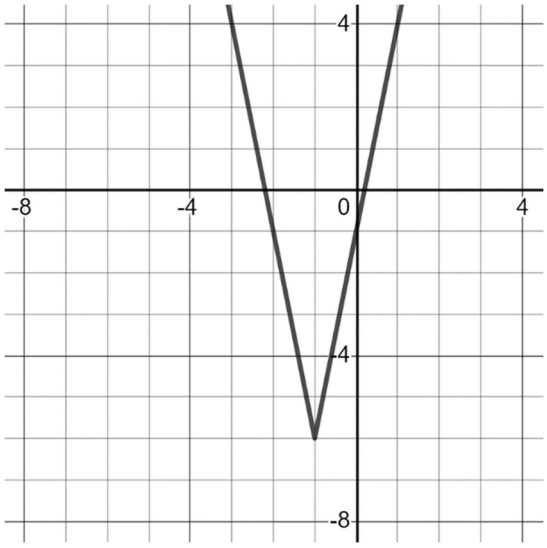
$$f(x) = -3|x| + 5$$

9.



$$f(x) = -\frac{1}{4}|x-4| - 1$$

10.



$$f(x) = 5|x+1| - 6$$

Write an absolute value function whose vertex is point V and passes through point P.

11. $V(0,3)$ $P(4,-1)$ $\boldsymbol{f(x) = -|x| + 3}$

12. $V(-2,0)$ $P(-6,4)$ $\boldsymbol{f(x) = |x + 2|}$

13. $V(1,4)$ $P(-1,-2)$ $\boldsymbol{f(x) = -3|x - 1| + 4}$

14. $V(6,-2)$ $P(-3,4)$ $\boldsymbol{f(x) = \frac{2}{3}|x - 6| - 2}$

15. $V(3,1)$ $P(2,6)$ $\boldsymbol{f(x) = 5|x - 3| + 1}$

16. $V(-2,-5)$ $P(4,3)$ $\boldsymbol{f(x) = \frac{4}{3}|x + 2| - 5}$

17. $V(-4,0)$ $P(0,-2)$ $\boldsymbol{f(x) = -\frac{1}{2}|x + 4|}$

18. $V(0,7)$ $P(-2,0)$ $\boldsymbol{f(x) = -\frac{7}{2}|x| + 7}$

Plot each set of ordered pairs on a coordinate plane and then write an absolute value function that passes through the three points.

19. $(-5,0), (-3,0)$, and $(0,3)$ $\boldsymbol{f(x) = |x + 4| - 1}$

20. $(-5,0), (-1,0)$, and $(0,-2)$ $\boldsymbol{f(x) = -2|x + 3| + 4}$

21. $(-4,-1), (11,1)$, and $(-19,5)$ $\boldsymbol{f(x) = \frac{2}{5}|x - 1| - 3}$

22. $(-2,4), (-8,-5)$, and $(4,1)$ $\boldsymbol{f(x) = -\frac{3}{2}|x| + 7}$

Write a function from each description.

23. an absolute value function whose parent graph has been translated 3 units right and 2 units up

$\boldsymbol{f(x) = |x - 3| + 2}$

24. an absolute value function whose parent graph has been reflected over the x-axis and translated 4 units up

$\boldsymbol{f(x) = -|x| + 4}$

25. an absolute value function whose parent graph has been compressed horizontally by a factor of 2 and translated 6 units left and 1 unit down

$\boldsymbol{f(x) = 2|x + 6| - 1}$

26. an absolute value function whose parent graph has been stretched horizontally by a factor of 2.5, translated 3 units up, and reflected over the x-axis

$\boldsymbol{f(x) = -\frac{2}{5}|x| + 3}$

27. an absolute value function whose parent graph has been compressed horizontally by a factor of $\frac{3}{2}$, translated five units right, and translated two units down

$\boldsymbol{f(x) = \frac{3}{2}|x - 5| - 2}$

28. an absolute value function whose parent graph has been stretched horizontally by a factor of 4, reflected over the x-axis, and translated 2 units to the left

$\boldsymbol{f(x) = -\frac{1}{4}|x + 2|}$