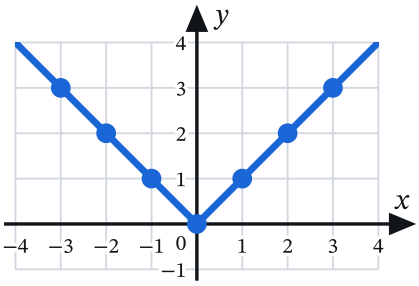
Names (pair) _____ Date _____

The Absolute Value Function

Example: $f(x) = |x|$



$|x|$ is the distance of x from 0.
For $x \geq 0$, $f(x) = x$, and for $x < 0$, $f(x) = -x$.
The graph is made of **two pieces of lines**, shaped like a V, with its vertex at $(0, 0)$.

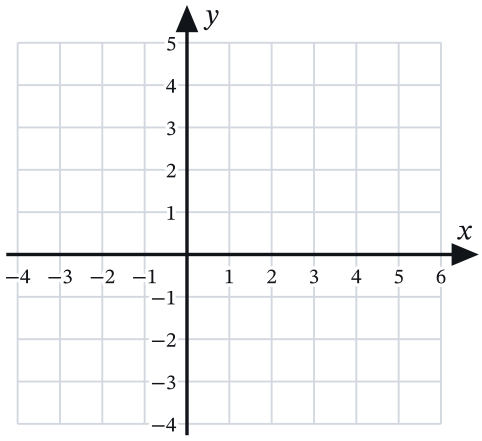
Remember

$f(x) = |x - a|$ is the distance from x to a: the graph is a V with its vertex at $(a, 0)$.
$f(x) = |x| + b$ shifts the graph b up or down. It is a piecewise linear function.

1 IN PAIRS Complete the tables and draw both graphs on the same axes.

x	-1	0	1	2	3	4	5
$\lvert x-2\rvert$	☐	☐	☐	☐	☐	☐	☐

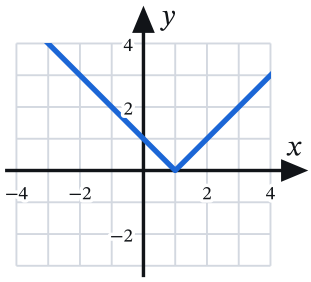
x	-3	-2	-1	0	1	2	3
$\lvert x\rvert - 3$	☐	☐	☐	☐	☐	☐	☐



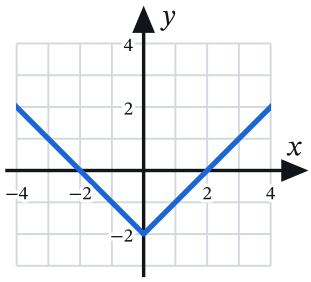
Names (pair) _____ Date _____

2 ON YOUR OWN Match each equation to a graph. Write the letter of the graph.

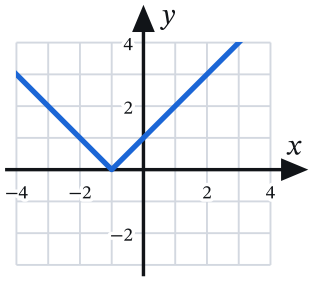
A



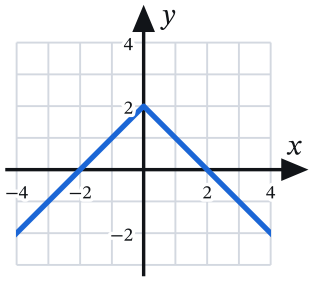
B



C

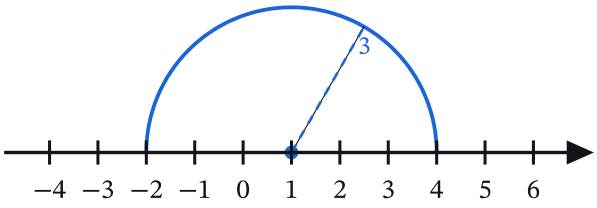


D



$f(x) = |x + 1|$ ☐ $f(x) = |x| - 2$ ☐ $f(x) = |x - 1|$ ☐ $f(x) = -|x| + 2$ ☐

3 ON YOUR OWN Solve using the graph of $f(x) = |x - 1|$: where is the graph at height 3, and where is it below? Compare with the semicircle with centre 1 and radius 3.



$|x - 1| = 3$: ☐

$|x - 1| < 3$: ☐

4 ON YOUR OWN Write $f(x) = |x - 2|$ without the absolute value.

$f(x) =$ ☐ for $x \geq 2$, $f(x) =$ ☐ for $x < 2$

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Type $|x - 2|$ and $|x| - 3$ and check your graphs.

★ ON YOUR OWN **Exit card.** The vertex of the graph of $f(x) = |x + 4|$ is at (☐, 0)