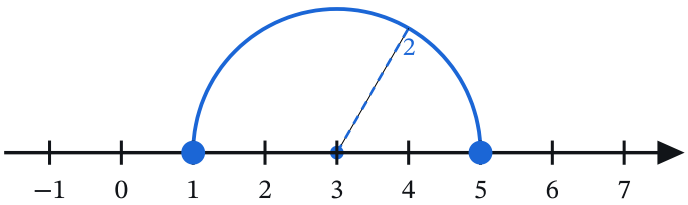
Names (pair) _____ Date _____

Equations with Absolute Values

Example



$|x-3|=2$: the distance of x from 3 is 2. The solutions are the ends of a semicircle with centre 3 and radius 2.

$x-3=2$ or $x-3=-2$

$x=5$ **or** $x=1$

Remember

$|a|$ is the distance of a from 0, and $|x-c|$ is the distance of x from c. The equation $|A|=b$: for $b>0$, $A=b$ or $A=-b$; for $b=0$, $A=0$; for $b<0$ there is no solution.

1 IN PAIRS Solve using distance: draw a semicircle with centre c and radius r. Its ends are the solutions. For $|2x+1|=6$, first divide by 2: $|x+\frac{1}{2}|=3$.

	Centre c	Radius r	On the line	Solutions
$\lvert x\rvert=2$			−4 −3 −2 −1 0 1 2 3 4 5	
$\lvert x-1\rvert=3$			−4 −3 −2 −1 0 1 2 3 4 5	
$\lvert 2x+1\rvert=6$			−4 −3 −2 −1 0 1 2 3 4 5	

Names (pair) _____ Date _____

2 ON YOUR OWN Solve algebraically.

$|2x - 1| = 5$ → ☐

$|3x + 6| = 0$ → ☐

$|x - 4| = -1$ → ☐

$|5 - x| = 2$ → ☐

3 IN PAIRS **Find the mistake.** Marko: $|x + 3| = 5 \rightarrow x + 3 = 5 \rightarrow x = 2$. What did he miss?

4 ON YOUR OWN First get the absolute value on its own, then solve.

$|x - 1| + 2 = 6$ → ☐

$2|x| - 3 = 7$ → ☐

5 IN PAIRS The temperature differs from 18 °C by 4 °C. Write an equation with an absolute value and find the possible temperatures.

☐ → ☐

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Intervals mode: type e.g. $|x - 3| = 2$ and look at the distances from the centre.

★ ON YOUR OWN **Exit card.** $|x - 5| = 3$ → ☐