

Summary

Outside the function:

$-x^3$ or $-\sqrt{x}$: **Negative sign reflects** the graph over the **x-axis**.

$x^3 + 1$ or $\sqrt{x} - 1$: **Adding** a number shifts the graph **up** and
Subtracting a number shifts the graph **down**.

$2x^3$ or $\frac{1}{2}\sqrt{x}$: Multiplying a **whole number** makes the graph **skinnier**
and multiplying a **fraction** makes the graph **wider**.

Inside the function:

$(-x)^3$ or $\sqrt{-x}$: **Negative sign reflects** the graph over the **y-axis**.

$(x + 1)^3$ or $\sqrt{(x - 1)}$: **Adding** a number shifts the graph **left** and
Subtracting a number shifts the graph **right**.

Name the parent function. Then describe how the graph of the function will be different from the parent function. Be specific.

1. $y = 2(x - 1)^2 + 5$

skinnier
right 1
up 5

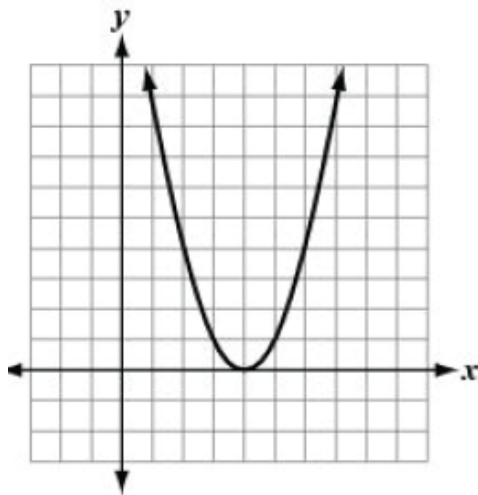
2. $y = -\frac{1}{4}|x + 3| - 1$

reflected over x-axis
wider
left 3
down 1

3. How does the graph of the function $f(x) = x^3 + 1$ compare to the parent function $f(x) = x^3$?

- A) shifted up 1 unit
- B) shifted down 1 unit
- C) shifted left 1 unit
- D) shifted right 1 unit

4. Which function is represented by the graph below?



A) $y = (x - 4)^4$

B) $y = |x - 4|$

C) $y = x^2 - 4$

D) $y = (x - 4)^2$

5. Which equation represents the graph of a parabola that opens up and is wider than the graph of $y = x^2$?

A) $y = 2x^2 + 3x - 5$

C) $y = -2x^2 + 3x - 5$

B) $y = \frac{1}{2}x^2 + 3x - 5$

D) $y = -\frac{1}{2}x^2 + 3x - 5$

Practice

Cut and Paste
Activity