

Algebra 2 - Transformations of Functions - Quiz

Common Core F-BF.B.3, F-IF.C.7 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

Answer ten multiple-choice questions on transformations of functions. Choose one option for each question, then read the explanation to see why the correct choice works and which mistake, such as moving the graph the wrong way for $f(x + h)$, each wrong choice shows.

Algebra 2 · Common Core State Standards: **F-BF.B.3, F-IF.C.7**

Questions

Question 1

How does the graph of $y = f(x) + 3$ compare with $y = f(x)$?

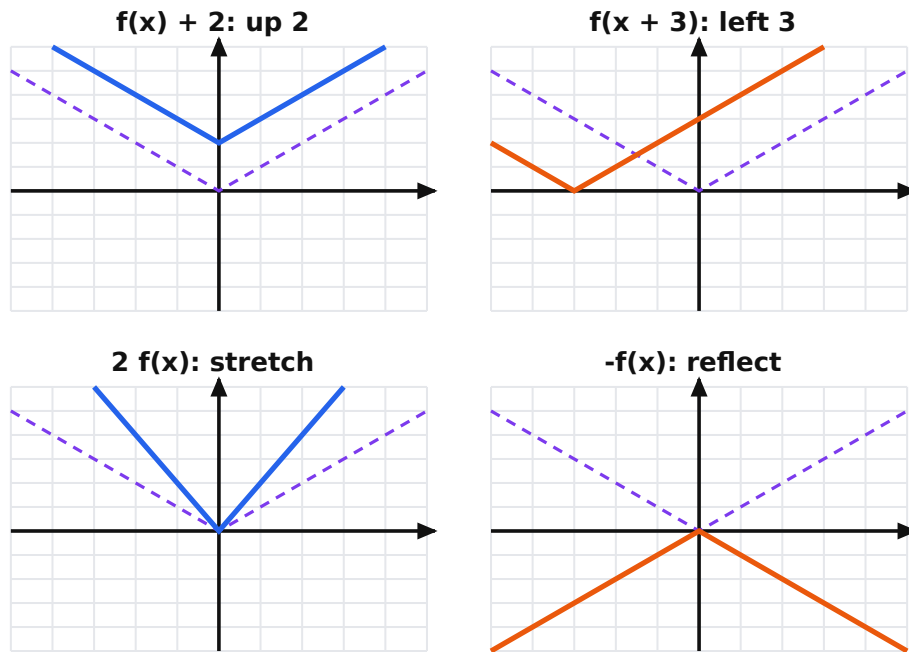
- A. Shifted right 3
- B. Shifted left 3
- C. Stretched by 3
- D. Shifted up 3

Question 2

How does $y = f(x - 5)$ compare with $y = f(x)$?

- A. Shifted right 5
- B. Shifted left 5
- C. Shifted up 5
- D. Shifted down 5

Question 3



Dashed: the parent $f(x) = |x|$. Solid: the transformed graph.

Which panel shows $-f(x)$?

- A. The top-left panel
- B. The bottom-right panel (reflected over the x-axis)
- C. The top-right panel
- D. The bottom-left panel

Question 4

What is the vertex of $g(x) = 2|x-3|+1$?

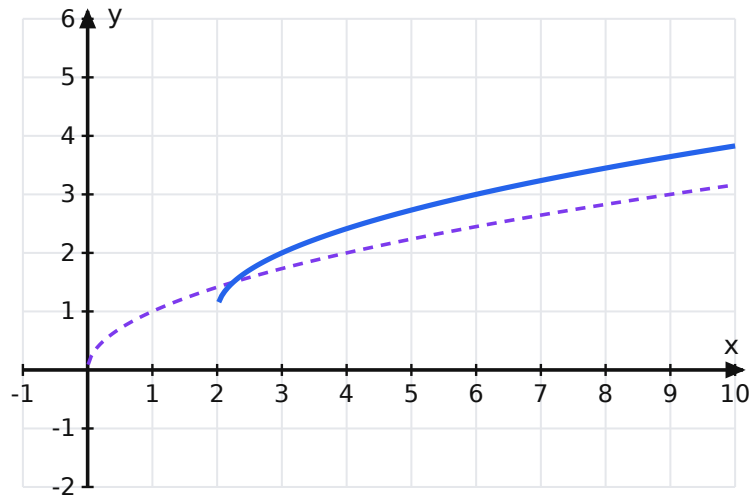
- A. $(-3,1)$
- B. $(3,-1)$
- C. $(2,1)$
- D. $(3,1)$

Question 5

Which function is even?

- A. $f(x) = x^3$
- B. $f(x) = x^2 - 5$
- C. $f(x) = x + 1$
- D. $f(x) = x^3 + x$

Question 6



Graph of a transformed square root.

The graph starts at (2, 1). Which equation matches?

- A. $g(x) = \sqrt{x-2} + 1$
- B. $g(x) = \sqrt{x+2} + 1$
- C. $g(x) = \sqrt{x-2} - 1$
- D. $g(x) = \sqrt{x} + 3$

Question 7

What is the range of $g(x) = -\sqrt{x} + 5$?

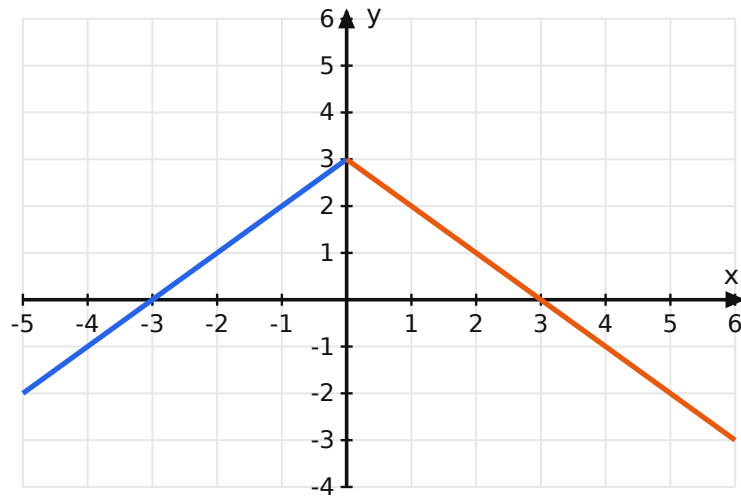
- A. $y \geq 5$
- B. $y \geq 0$
- C. $y \leq 5$
- D. $y \leq 0$

Question 8

If (4,6) is on the graph of f , which point is on $y = f(x) - 2$?

- A. (2,6)
- B. (4,4)
- C. (4,8)
- D. (6,6)

Question 9



$$f(x) = x + 3 \text{ for } x < 0 \text{ and } f(x) = 3 - x \text{ for } x \geq 0.$$

What is $f(2)$ for the piecewise function shown ($x + 3$ for $x < 0$, $3 - x$ for $x \geq 0$)?

- A. 5
- B. -1
- C. 1
- D. 3

Question 10

Which transformation takes $f(x)$ to $f(-x)$?

- A. Reflection over the y-axis
- B. Reflection over the x-axis
- C. Shift left
- D. Vertical stretch by -1

Answers

1. **D** - Adding 3 to every output raises the graph by 3.
2. **A** - The input must be 5 larger for the same output, so the graph moves right.
3. **B** - $-f(x)$ flips the graph over the x-axis, so the V opens downward.
4. **D** - The vertex of $|x|$ moves right 3 and up 1. The factor 2 does not move the vertex.
5. **B** - $f(-x) = (-x)^2 - 5 = x^2 - 5 = f(x)$.
6. **A** - The starting point moves right 2 and up 1.
7. **C** - Since $\sqrt{x} \geq 0$, $-\sqrt{x} \leq 0$, and adding 5 gives $g(x) \leq 5$.
8. **B** - Subtracting 2 from the output lowers the point to (4, 4).
9. **C** - $x = 2$ uses the second rule: $3 - 2 = 1$.
10. **A** - Replacing x with $-x$ flips the graph left-right, over the y-axis.

Remember

- $f(x) + k$: up k ; $f(x - h)$: right h .
- $a \cdot f(x)$: vertical stretch by $|a|$; negative a reflects over the x-axis.
- $f(bx)$: horizontal compression by $1/|b|$; negative b reflects over the y-axis.
- Even: $f(-x) = f(x)$; odd: $f(-x) = -f(x)$.
- Piecewise functions use different rules on different intervals.