

Algebra 2 · Transformations of Functions · Test

Common Core F-BF.B.3, F-IF.C.7b · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

This test covers shifts, stretches and reflections, even and odd functions, and square root, cube root and exponential graphs. It has nine questions worth 20 points in total. Show your work and use a straightedge for graphs. Calculators are optional.

Test information

- **Grade:** Algebra 2
- **Chapter:** Transformations of Functions
- **Common Core:** F-BF.B.3, F-IF.C.7b
- **Time:** 45 minutes
- **Total:** 20 points (Question 1: 2 pts; Question 2: 2 pts; Question 3: 2 pts; Question 4: 3 pts; Question 5: 3 pts; Question 6: 2 pts; Question 7: 2 pts; Question 8: 2 pts; Question 9: 2 pts)

Question 1: Shifts of absolute value (2 points)

Let $g(x) = |x+3| - 5$ and $f(x) = |x|$.

- Describe how the graph of g differs from the graph of f . (1 point)
- Give the vertex of g . (1 point)

Question 2: Transform points (2 points)

The graph of f contains the points $(-4, 2)$, $(0, -3)$ and $(6, 5)$. Give three points on each graph.

- $g(x) = f(x+3)$ (1 point)
- $h(x) = 2f(x)$ (1 point)

Question 3: Write an equation (2 points)

The graph of $f(x) = x^2$ is reflected over the x-axis, then shifted right 2 and up 7 to form g .

- Write an equation for $g(x)$. (1 point)
- Find $g(5)$. (1 point)

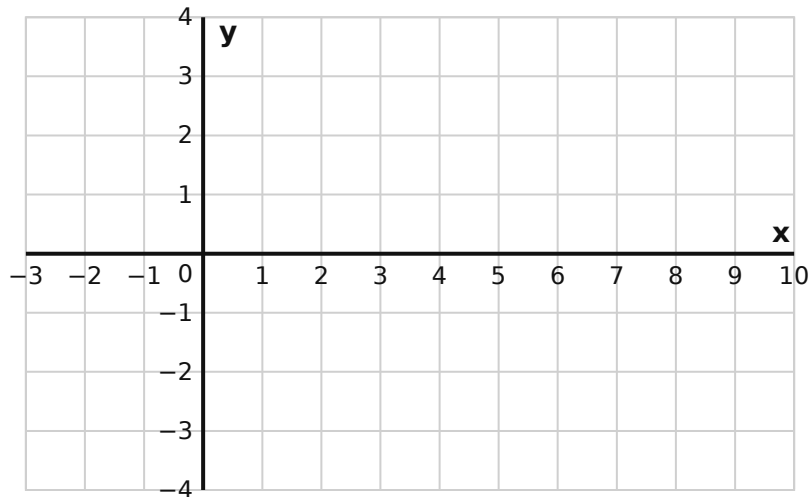
Question 4: Even and odd (3 points)

Determine whether each function is even, odd or neither. Show the work.

- a. $f(x) = 2x^4 - x^2$ (1 point)
- b. $g(x) = x^3 - 5x$ (1 point)
- c. $h(x) = x^2 + 3x$ (1 point)

Question 5: Graph a square root (3 points)

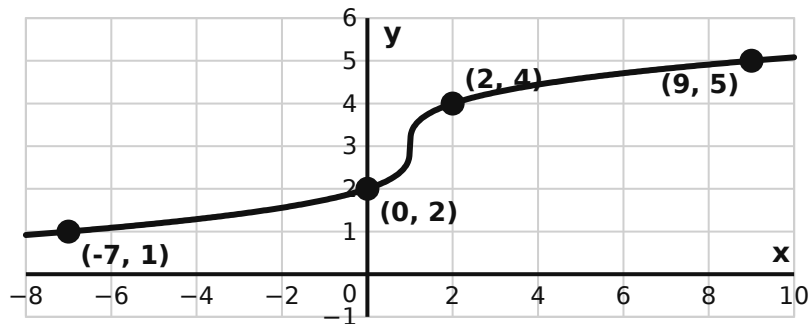
Graph $y = \sqrt{x+1} - 2$ and state its domain and range.



Blank grid.

Question 6: Cube root from a graph (2 points)

Write an equation of the form $y = \sqrt[3]{x-h} + k$ for the graph.



A cube root curve.

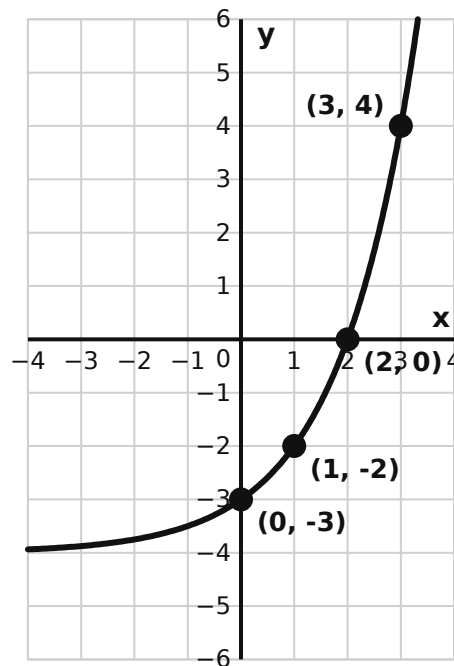
Question 7: Stretch and reflect (2 points)

The graph of $g(x) = -\frac{1}{2}|x| + 4$ is a transformation of $f(x) = |x|$.

- Describe every transformation. (1 point)
- Find $g(6)$. (1 point)

Question 8: Exponential graph (2 points)

The graph of $g(x) = 2^x - 4$ is shown.



An exponential graph.

- State the horizontal asymptote. (1 point)
- State the x-intercept. (1 point)

Question 9: Skid speed (2 points)

A car's speed in miles per hour is $s(d) = \sqrt{24d}$, where d is the skid length in feet.

- Find the speed for a 24-foot skid. (1 point)
- Find the skid length for a speed of 36 mph. (1 point)