

Algebra 2 · Transformations of Functions · Test Answer Key

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

Use this key to score the test out of 20 points. Each solution shows the full work, and the scoring note explains how the points are awarded. Accept equivalent equations and any correct graph through the listed points.

Algebra 2 Common Core: F-BF.B.3 · F-IF.C.7b

Question 1: Shifts of absolute value (2 points)

- a. Shifted **left 3 and down 5**.
- b. Vertex: $(-3, -5)$.

Scoring: 1 point for each correct direction pair in (a), accepting 'left 3, down 5' only with both parts; 1 point for the vertex.

Question 2: Transform points (2 points)

- a. Subtract 3 from each x-coordinate: $(-7, 2), (-3, -3), (3, 5)$.
- b. Double each y-coordinate: $(-4, 4), (0, -6), (6, 10)$.

Scoring: 1 point per part, all three points correct.

Question 3: Write an equation (2 points)

- a. $g(x) = -(x-2)^2 + 7$.
- b. $g(5) = -(3)^2 + 7 = -9 + 7 = -2$.

Scoring: 1 point for the equation; 1 point for the value.

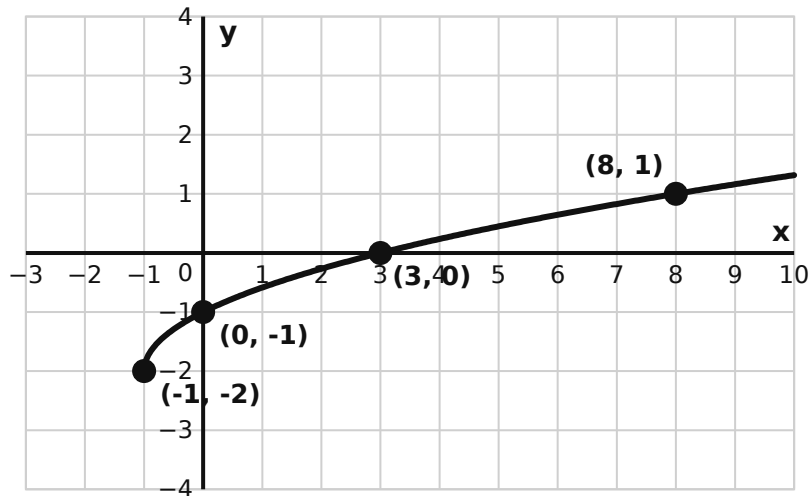
Question 4: Even and odd (3 points)

- a. $f(-x) = 2x^4 - x^2 = f(x)$: even.
- b. $g(-x) = -x^3 + 5x = -g(x)$: odd.
- c. $h(-x) = x^2 - 3x$, not equal to $h(x)$ or $-h(x)$: neither.

Scoring: 1 point per part for the correct classification supported by computing $f(-x)$.

Question 5: Graph a square root (3 points)

The start is $(-1, -2)$. Points: $(-1, -2), (0, -1), (3, 0), (8, 1)$.



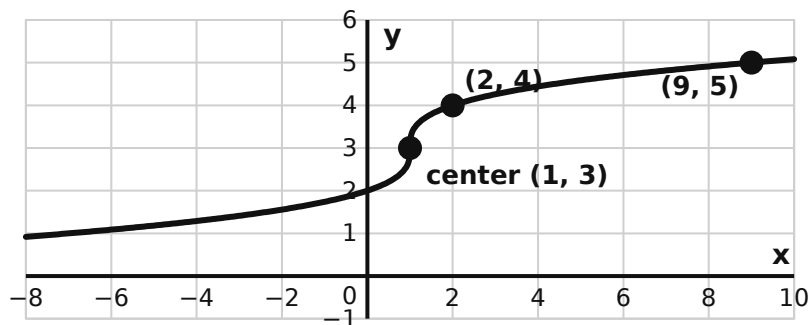
The graph of the function.

Domain: $x \geq -1$. Range: $y \geq -2$.

Scoring: 1 point for the correct starting point; 1 point for a correct curve through at least three points; 1 point for domain and range.

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

The curve flattens at its center $(1, 3)$, so $h=1$ and $k=3$. Check $(9, 5)$: $\sqrt[3]{8}+3=5$. Equation: $y = \sqrt[3]{x-1}+3$.



The center is $(1, 3)$.

Scoring: 1 point for identifying the center; 1 point for the equation.

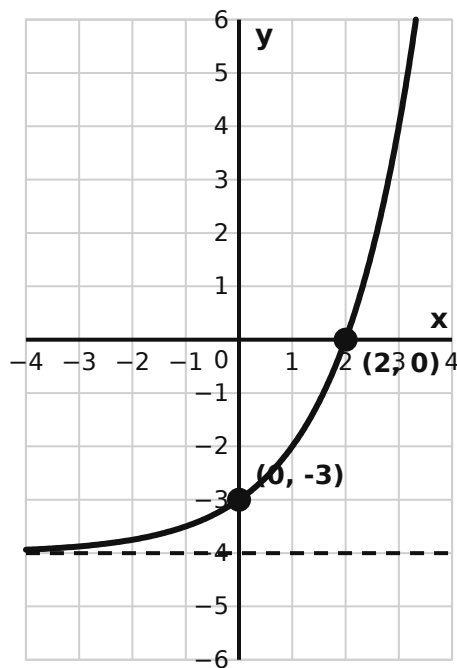
Question 7: Stretch and reflect (2 points)

- a. Vertical compression by $\frac{1}{2}$, reflection over the x-axis, and a shift up 4.
- b. $g(6) = -\frac{1}{2}(6) + 4 = -3 + 4 = 1$.

Scoring: 1 point for naming all three transformations; 1 point for the value.

Question 8: Exponential graph (2 points)

- a. The parent 2^x has asymptote $y = 0$; shifting down 4 gives $y = -4$.
- b. $2^x = 4$ gives $x = 2$: $(2, 0)$.



The graph with its asymptote.

Scoring: 1 point per part.

Question 9: Skid speed (2 points)

- a. $s(24) = \sqrt{576} = 24$ mph.
- b. $36 = \sqrt{24d}$ gives $1296 = 24d$ and $d = 54$ feet.

Scoring: 1 point per part.

Total
20 points