

Algebra 1 - Graphing Quadratic Functions and Transformations - Test Answer Key

Common Core F-IF.C.7a, F-IF.C.8a, F-BF.B.3, A-SSE.B.3b · maths-pdf.fr/en/

These are worked solutions for the quadratic functions test with a scoring guide for every question. Award points for correct method as well as for the final answer. The test totals 20 points, so add the question scores to find the final grade.

Algebra 1 · Common Core State Standards: **F-IF.C.7a, F-IF.C.8a, F-BF.B.3, A-SSE.B.3b**

Question 1 - Vertex form [2 pts]

$$a = 2, h = 3, k = -1.$$

Vertex $(3, -1)$; **axis** $x = 3$; **opens up**

Scoring: 1 point for the vertex and axis; 1 point for the direction.

Question 2 - Vertex from standard form [2 pts]

$$x = -\frac{-10}{2(1)} = 5. \text{ Then } y = 25 - 50 + 16 = -9.$$

$$(5, -9)$$

Scoring: 1 point for the x-coordinate; 1 point for the y-coordinate.

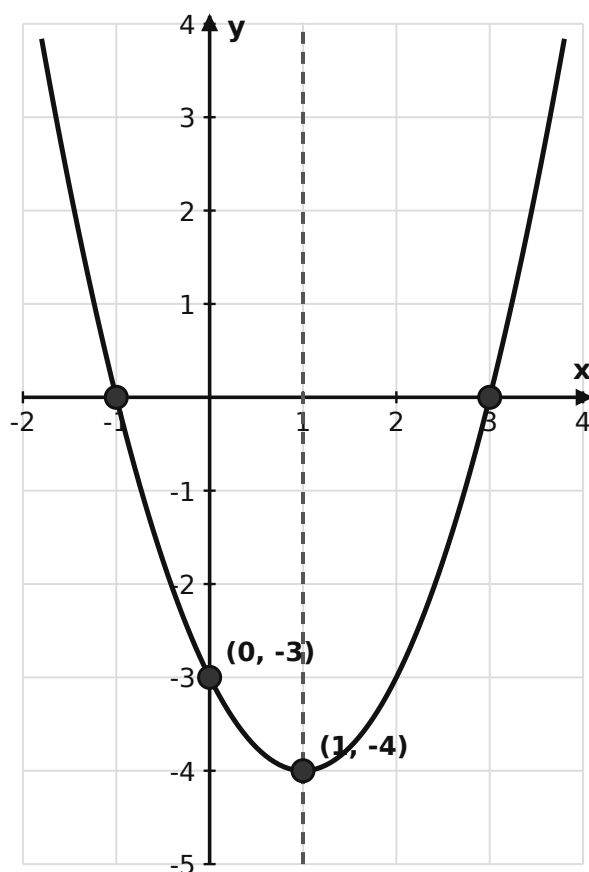
Question 3 - Intercepts [2 pts]

y-intercept: $(0, -6)$. Factor: $(x-3)(x+2) = 0$.

(0, -6); (3, 0) and (-2, 0)

Scoring: 1 point for the y-intercept; 1 point for both x-intercepts.

Question 4 - Graph a parabola [2 pts]



Vertex, intercepts, and axis.

Axis $x=1$. Vertex $(1,-4)$. Intercepts $(-1,0)$, $(3,0)$, $(0,-3)$.

Scoring: 1 point for the correct vertex; 1 point for a correct smooth graph.

Question 5 - Describe transformations [2 pts]

Left 3 (from $x+3$), reflection over the x-axis (the negative sign), and up 2.

Left 3, reflect, up 2

Scoring: 1 point for the shifts; 1 point for the reflection.

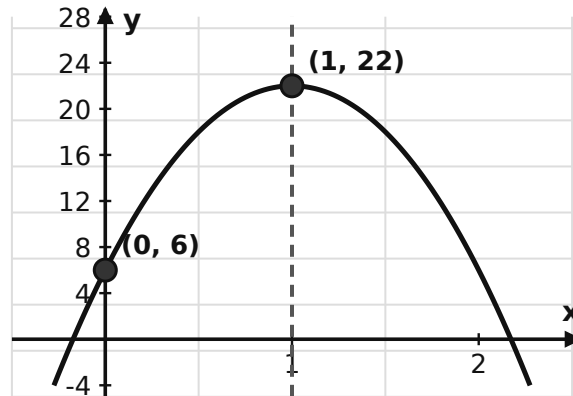
Question 6 - Complete the square [2 pts]

$$y = (x^2 + 4x + 4) - 4 + 1.$$

$$y = (x+2)^2 - 3$$

Scoring: 1 point for adding and subtracting 4; 1 point for the vertex form.

Question 7 - Ball height [3 pts]



Maximum 22 feet at 1 second.

a) $t = -\frac{32}{2(-16)} = 1.$

b) $h(1) = -16 + 32 + 6 = 22.$

c) $h(0) = 6.$

1 second; 22 feet; 6 feet

Scoring: 1 point per part.

Question 8 - Largest area [3 pts]

a) $A = x(30 - x) = -x^2 + 30x.$

b) $x = -\frac{30}{2(-1)} = 15.$

c) $A(15) = 15 \cdot 15 = 225.$

225 square feet when x = 15

Scoring: 1 point per part.

Question 9 - Compare functions [2 pts]

The minimum of f is 5. For g : $x=3$, $g(3)=9-18+12=3$.

f has the greater minimum (5 versus 3)

Scoring: 1 point for each minimum value.

Total
20 points