

Algebra 2 - Forms of Quadratic Functions - Test Answer Key

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

Use this answer key and scoring guide to grade the test on the forms of quadratic functions (A-SSE.B.3a). Each solution shows the full reasoning, and the scoring note explains how many points to award for correct setup, correct work, and a correct final answer. Partial credit rewards a sound method even when a small arithmetic slip changes the result.

Algebra 2 · Common Core State Standards: **A-SSE.B.3a, A-SSE.B.3b, F-IF.C.8a**

Question 1 - Zeros from factored form [2 pts]

Zeros: $x = -6$ and $x = 2$. Axis: $x = \frac{-6+2}{2} = -2$.

Zeros -6, 2; axis x = -2

Scoring: 1 point for the zeros, 1 point for the axis.

Question 2 - Complete the square [3 pts]

1. Take half of the x -coefficient 6: 3. Square it: 9.
2. Add and subtract 9: x^2+6x+1 becomes $(x^2+6x+9)+1-9$.
3. Write the perfect square and combine constants: $y = (x+3)^2-8$.

$(x+3)^2-8$; **vertex** $(-3,-8)$

Scoring: 1 point for the correct number to add and subtract, 1 point for vertex form, 1 point for the vertex.

Question 3 - Vertex from standard form [2 pts]

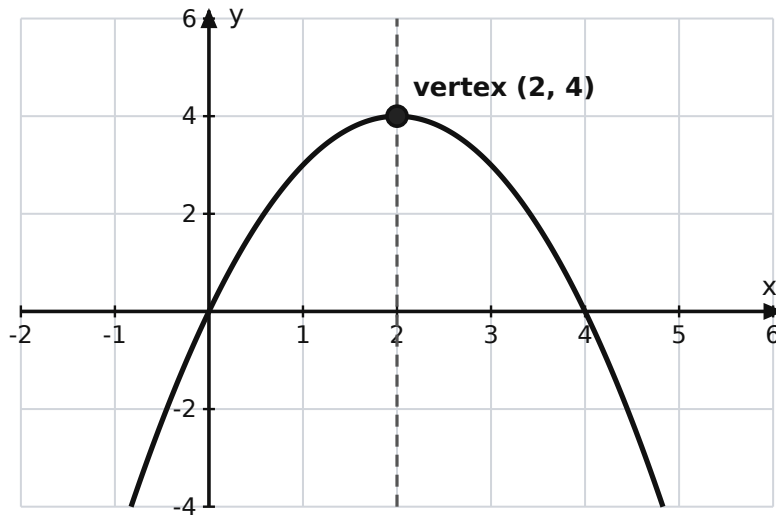
$x = -\frac{-12}{2(3)} = 2$. $g(2) = 12 - 24 + 7 = -5$. Since $a = 3 > 0$, it is a minimum.

Vertex (2, -5), a minimum

Scoring: 1 point for the x-coordinate, 1 point for the y-coordinate and classification.

Question 4 - Equation from a graph [2 pts]

$f(x) = a(x-2)^2 + 4$. Substitute $(0,0)$: $0 = 4a + 4$, so $a = -1$.



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

$$f(x) = -(x-2)^2 + 4$$

Scoring: 1 point for the setup, 1 point for $a = -1$ and the equation.

Question 5 - Projectile [2 pts]

$$t = -\frac{96}{2(-16)} = 3. \quad h(3) = -144 + 288 = 144.$$

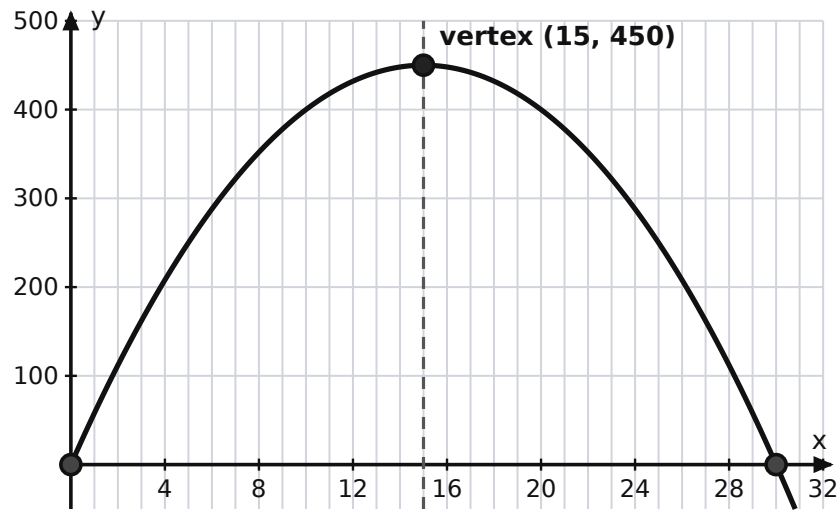
144 feet at $t = 3$ seconds

Scoring: 1 point for the time, 1 point for the height.

Question 6 - Revenue [2 pts]

Factored form: $R(p) = -2p(p-30)$, zeros 0 and 30.

The vertex is halfway: $p = 15$, and $R(15) = -450 + 900 = 450$.



Vertex (15, 450).

$R(p) = -2p(p - 30)$; price \$15, revenue \$450

Scoring: 1 point for the factored form, 1 point for the price.

Question 7 - Choose the form [2 pts]

- a. $(x-2)(x-4)=0$: zeros 2 and 4.
- b. Axis $x=3$; $f(3)=9-18+8=-1$.

(a) 2 and 4; (b) (3, -1)

Scoring: 1 point for each part.

Question 8 - Complete the square, $a = 2$ [3 pts]

- Factor 2 from the x^2 and x terms: $2(x^2-4x)+3$.
- Take half of the x -coefficient -4 : -2 . Square it: 4.
- Add and subtract 4 inside the parentheses: the subtracted amount becomes $2 \cdot 4 = 8$ outside.
- Write the perfect square and combine constants: $y = 2(x-2)^2 - 5$.

$$2(x-2)^2 - 5$$

Scoring: 1 point for factoring out 2, 1 point for completing the square correctly, 1 point for the

final form.

Question 9 - Find the error [2 pts]
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Vertex form is $(x-h)^2+k$. Here $x+3 = x-(-3)$, so $h = -3$.

The vertex is (-3, -1)

Scoring: 1 point for the sign explanation, 1 point for the vertex.

Total
20 points