

Algebra 2 · Interpreting and Comparing Functions · Test Answer Key

Common Core F-IF.B.4, F-IF.B.5, F-IF.B.6, F-IF.C.8a, F-IF.C.9 · mathovore.fr

This algebra 2 function test answer key gives the full solution and the scoring guide for each of the 8 test questions on interpreting and comparing functions.

Worked solutions and a scoring guide for the 20-point test on interpreting and comparing functions. Award partial credit exactly as each scoring note describes, and accept any equivalent correct form of an answer.

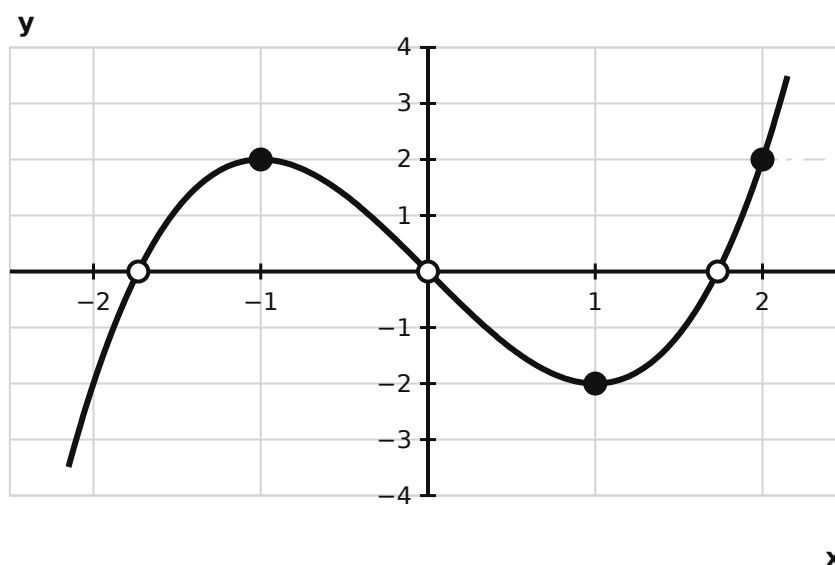
Algebra 2 Common Core: F-IF.B.4 · F-IF.B.5 · F-IF.B.6 · F-IF.C.8a · F-IF.C.9

Algebra 2 Function Test Answer Key: questions 1-5

Question 1: Key features of a cubic (3 points)

- a. $x^3 - 3x = x(x^2 - 3) = 0$ gives $x = 0$, $x = \pm\sqrt{3}$.
- b. The graph rises up to $(-1, 2)$, falls to $(1, -2)$ and rises again: increasing for $x < -1$ and $x > 1$.
- c. $\frac{f(2) - f(1)}{2 - 1} = \frac{2 - (-2)}{1} = 4$.

Scoring: (a) 1 point for all three zeros; (b) 1 point for both intervals; (c) 1 point for the correct rate of 4.



Zeros and intervals of increase and decrease.

Question 2: Domain and maximum in context (2 points)

- a. Both w and the length $60-2w$ must be positive, so the domain is $0 < w < 30$.
- b. The zeros are $w=0$ and $w=30$, so the axis is $w=15$. Then $A(15)=15(30)=450$. The greatest area is **450 square feet** when $w=15$.

Scoring: (a) 1 point; (b) 1 point for the area and 1 point included for the matching width (both needed).

Question 3: Average rate of change (3 points)

- a. $f(5)=5$ and $f(1)=-3$, so $\frac{5-(-3)}{5-1}=\frac{8}{4}=2$. The answer is **2**.
- b. $\frac{1050-250}{30-10}=\frac{800}{20}=40$ **dollars per poster**.
- c. Between 10 and 30 posters, the total cost rises by an average of **\$40 for each additional poster**.

Scoring: 1 point for each part; part (b) requires units; part (c) must mention the interval 10 to 30 posters.

Question 4: Complete the square (3 points)

- a. $f(x)=x^2-8x+16-16+3$ gives $f(x)=(x-4)^2-13$.
- b. The vertex is $(4,-13)$, so the minimum value is **-13 at $x=4$** .

Scoring: (a) 1 point for adding and subtracting 16, 1 point for the correct vertex form; (b) 1 point for both the value and its location.

Question 5: Factored form of a quadratic (2 points)

- a. $g(x)=2(x^2-x-6)=2(x-3)(x+2)$, so the zeros are **$x=3$ and $x=-2$** .
- b. The axis is halfway between the zeros: $x=0.5$. Then $g(0.5)=2(0.5-3)(0.5+2)=2(-2.5)(2.5)=-12.5$. The minimum value is **-12.5**.

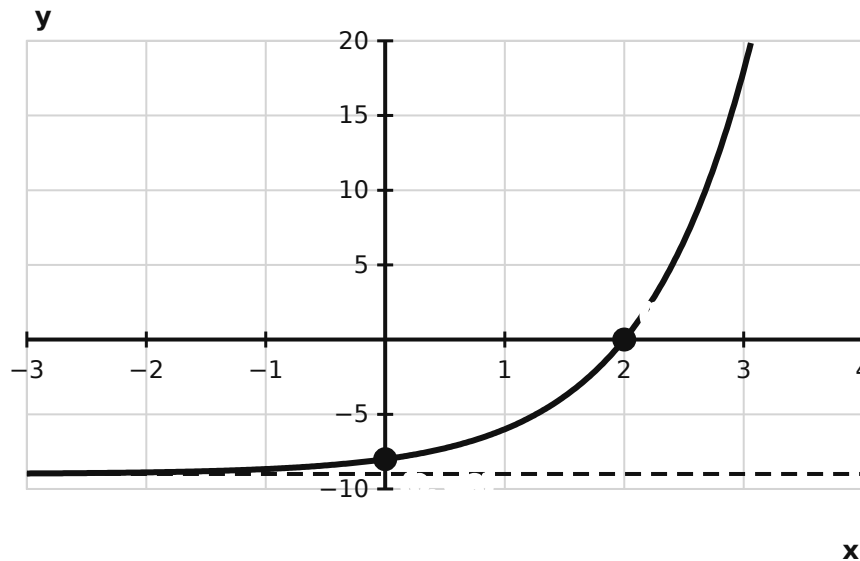
Scoring: (a) 1 point for the factorization and both zeros; (b) 1 point for the axis and the minimum value.

Algebra 2 Function Test Answer Key: questions 6-8

Question 6: Exponential features (2 points)

- a. $f(0)=3^0-9=-8$, so the y-intercept is **$(0,-8)$** .
- b. As x decreases, 3^x approaches 0, so $f(x)$ approaches **-9**. The asymptote is **$y=-9$** .

Scoring: 1 point for each part. In (a), accept **-8** without the coordinates.



The asymptote $y = -9$, the y-intercept and the zero.

Question 7: Compare two functions (3 points)

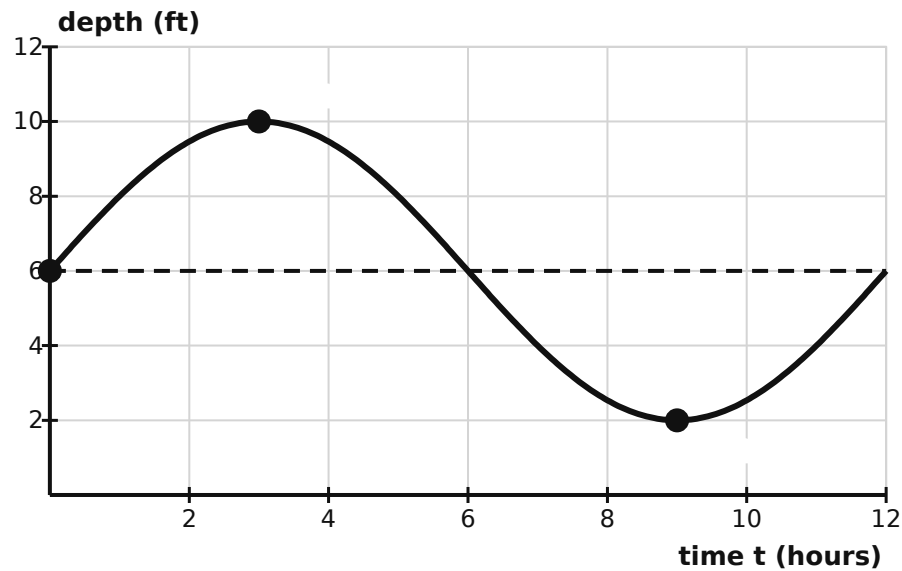
- The vertex of f is $(2,9)$, so its maximum is 9. The table of g is symmetric about $x=1$ with top value 11, so its maximum is 11. g **has the greater maximum**.
- $f(0) = -4 + 9 = 5$ and $g(0) = 9$. g has the greater y-intercept.
- $f: \frac{9-5}{2} = 2$ and $g: \frac{9-9}{2} = 0$. f has the greater average rate of change.

Scoring: 1 point per part; each part needs the correct function and both values.

Question 8: Periodic function (2 points)

- The graph repeats every **12 hours**. The maximum depth is **10 ft** and the minimum is **2 ft**.
- $d(0) = 6$ and $d(3) = 10$, so $\frac{10-6}{3} = \frac{4}{3}$ **feet per hour**.

Scoring: (a) 1 point for all three values; (b) 1 point for $\frac{4}{3}$ (about 1.33) with units.



Midline 6, maximum (3, 10), minimum (9, 2).

Scoring summary

Total

20 points: add the points of every question of this algebra 2 function test answer key.

How to use this algebra 2 function test answer key

Use this algebra 2 function test answer key to score the test fairly and to see which skills need more practice.

