

Algebra 2 · Interpreting and Comparing Functions · Test

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

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

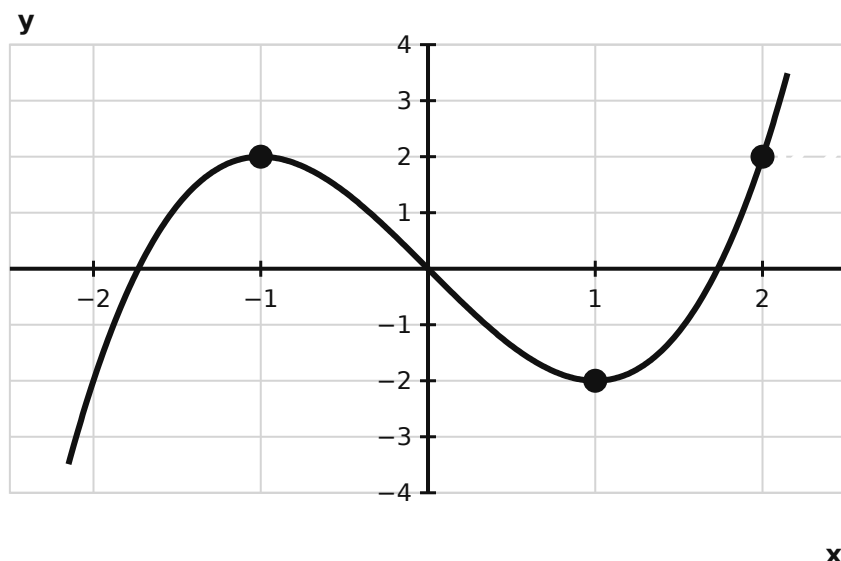
This 20-point test covers interpreting and comparing functions: key features of graphs, domain in context, average rate of change, rewriting quadratics by factoring and completing the square, and comparing functions given in different forms. Allow about 45 minutes, show all work, and include units where the question has a context.

Test information

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

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

The graph shows $f(x) = x^3 - 3x$.



The graph of f with three labeled points.

- Find the zeros of f . (1 point)
- State the intervals on which f is increasing. (1 point)
- Find the average rate of change of f on $[1,2]$. (1 point)

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

A rancher uses 60 feet of fence along a barn wall to enclose a rectangular pen on three sides. If the sides perpendicular to the barn have length w feet, the area is $A(w) = w(60 - 2w)$ square feet.

- State the domain of A in this context. (1 point)
- Find the greatest possible area and the value of w that gives it. (1 point)

Question 3: Average rate of change (3 points)

The total cost $C(n)$ of printing n team posters is given in the table.

n (posters)	0	10	20	30
$C(n)$ (dollars)	0	250	600	1050

- Find the average rate of change of $f(x) = x^2 - 4x$ on $[1,5]$. (1 point)
- Find the average rate of change of C on $[10,30]$. (1 point)
- Interpret your answer to part (b) in context. (1 point)

Question 4: Complete the square (3 points)

Let $f(x) = x^2 - 8x + 3$.

- Rewrite f in vertex form by completing the square. (2 points)
- State the minimum value of f and the x -value where it occurs. (1 point)

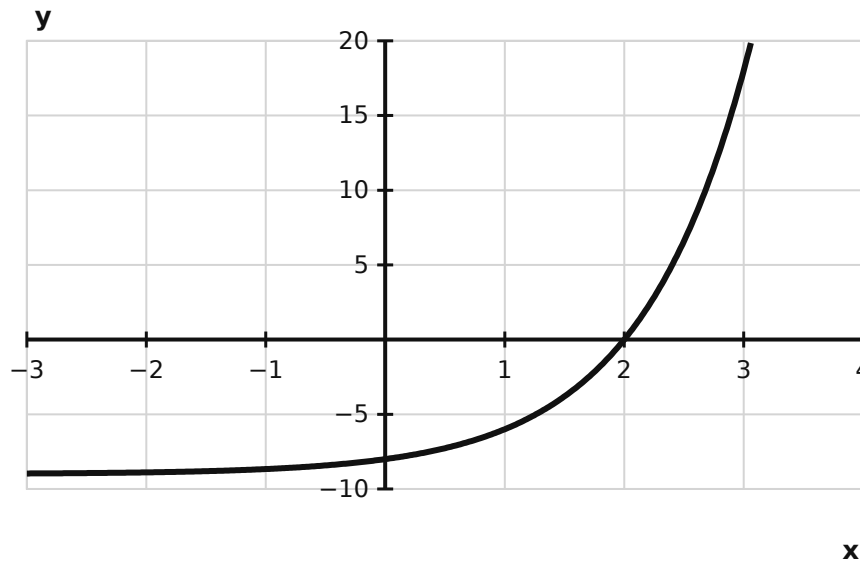
Question 5: Factored form of a quadratic (2 points)

Let $g(x) = 2x^2 - 2x - 12$.

- Factor g and find its zeros. (1 point)
- Find the minimum value of g . (1 point)

Question 6: Exponential features (2 points)

The graph shows $f(x) = 3^x - 9$.



The graph of f .

- Find the y-intercept of f . (1 point)
- Write the equation of the horizontal asymptote. (1 point)

Question 7: Compare two functions (3 points)

Function f is $f(x) = -(x-2)^2 + 9$. Function g is a quadratic with the values in the table.

x	-1	0	1	2	3
$g(x)$	3	9	11	9	3

- Which function has the greater maximum value? Give both maximums. (1 point)
- Which function has the greater y-intercept? Give both. (1 point)
- Which function has the greater average rate of change on $[0, 2]$? Give both rates. (1 point)

Question 8: Periodic function (2 points)

The depth of water at a dock is $d(t) = 6 + 4\sin\left(\frac{\pi t}{6}\right)$ feet, where t is the number of hours after 6:00 a.m.



The tide over 12 hours.

- State the period, the maximum depth and the minimum depth. (1 point)
- Find the average rate of change on $[0,3]$ with units. (1 point)