

Algebra 1 · Graphs as Solution Sets, Linear-Quadratic Systems and Exponential Expressions · Test

Common Core A-REI.D.10, A-REI.C.7, F-IF.C.7e, A-SSE.B.3c · mathovore.fr

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

This test has 8 questions worth 20 points in total and takes about 45 minutes. Decide which points are solutions, solve a system with a line and a parabola, and work with exponential graphs and exponent rules. Show your work for every question.

Test information

- **Grade:** Algebra 1
- **Chapter:** Graphs as Solution Sets, Linear-Quadratic Systems and Exponential Expressions
- **Common Core:** A-REI.D.10, A-REI.C.7, F-IF.C.7e, A-SSE.B.3c
- **Time:** 45 minutes
- **Total:** 20 points (Question 1: 2 pts; Question 2: 2 pts; Question 3: 3 pts; Question 4: 3 pts; Question 5: 2 pts; Question 6: 3 pts; Question 7: 3 pts; Question 8: 2 pts)

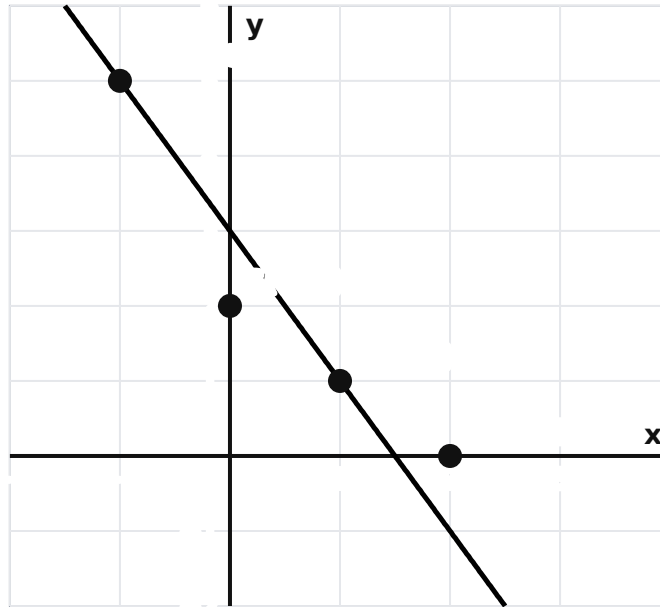
Question 1: Points on a graph (2 points)

The graph of $y = x^2 - 5$ is a parabola.

- Is $(-3, 4)$ on the graph? Justify. (1 point)
- Is $(2, 1)$ on the graph? Justify. (1 point)

Question 2: Solutions on a line (2 points)

The line shown is the graph of $y = -2x + 3$.



A line with four plotted points.

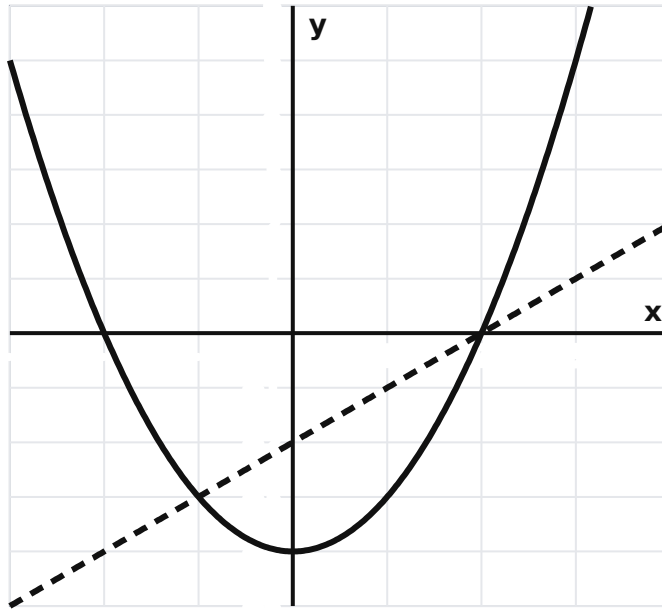
- Which of the points P, Q, R and S are solutions of the equation? (1 point)
- Show by substitution that one of the other points is not a solution. (1 point)

Question 3: Line and parabola system (3 points)

Solve the system $y = x^2 - 6x + 8$ and $y = 2x - 7$. Show all work.

Question 4: Reading a system graph (3 points)

The graph shows $y = x^2 - 4$ (solid) and $y = x - 2$ (dashed).



A parabola and a line.

- Estimate the coordinates of the intersection points from the graph. (1 point)
- Verify them by solving the system algebraically. (2 points)

Question 5: How many solutions? (2 points)

Decide how many solutions each system has and justify with algebra.

- $y = x^2 + 1$ and $y = 1$ (1 point)
- $y = x^2 + 1$ and $y = 0$ (1 point)

Question 6: Features of an exponential (3 points)

Let $f(x) = 4 \cdot 2^x$.

- Find the y-intercept. (1 point)
- Explain why the graph has no x-intercept. (1 point)
- Describe the end behavior as x gets very large and very small. (1 point)

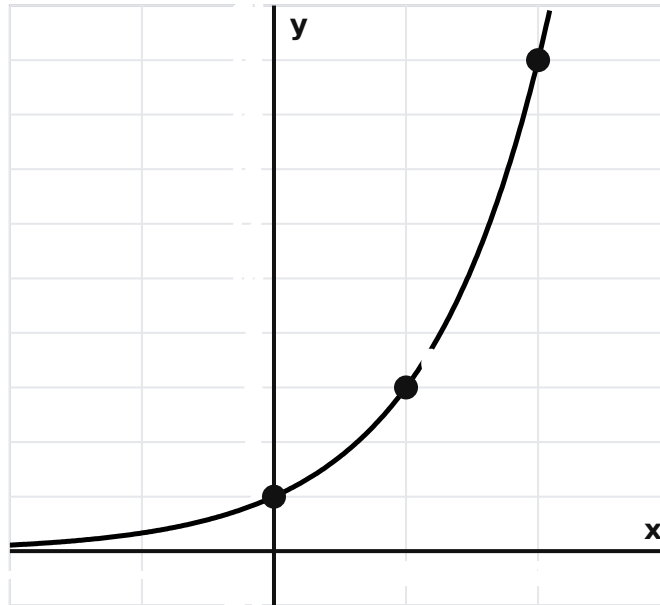
Question 7: Rewrite exponentials (3 points)

(a) Write 16^x as a power of 2. (1 point)

(b) An investment grows by a factor of 1.07 each year, so its value is 1.07^t times the deposit. Rewrite this with an exponent of $12t$ and find the monthly growth rate to the nearest hundredth of a percent. (2 points)

Question 8: Find the exponential (2 points)

The graph of an exponential function $y = a \cdot b^x$ passes through the plotted points.



Three points on an exponential curve.

- Write the equation. (1 point)
- Describe what happens to y as x gets very small. (1 point)