

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

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

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

Answer these 10 multiple-choice questions on solutions and graphs of equations, systems with a line and a parabola, exponential graphs and exponent rules. Each question has one correct answer. Substitute to check before you choose.

Algebra 1 Common Core: **A-REI.D.10 · A-REI.C.7 · F-IF.C.7e · A-SSE.B.3c**

Questions

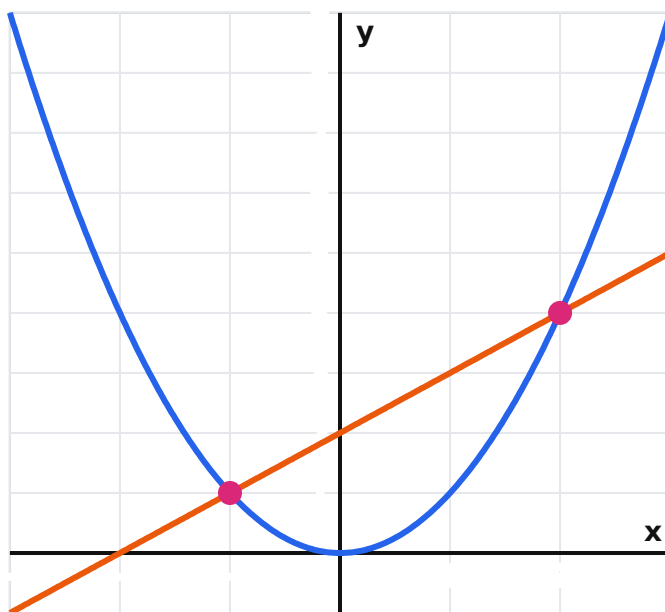
Question 1

Which ordered pair is a solution of $y = 3x - 4$?

- A. (5,3)
- B. (2,3)
- C. (3,5)
- D. (4,-8)

Question 2

The graph shows $y = x^2$ and $y = x + 2$. What are the solutions of the system?



A parabola and a line.

- A. $(-1,1)$ and $(2,4)$
- B. $(-1,1)$ and $(4,2)$
- C. $(-2,4)$ and $(1,1)$
- D. $(0,0)$ and $(2,4)$

Question 3

Solve $y = x^2$ and $y = 3x + 4$.

- A. $(-1,1)$ and $(4,16)$
- B. $(1,-1)$ and $(4,16)$
- C. $(-1,1)$ and $(4,7)$
- D. $(1,7)$ and $(-4,16)$

Question 4

How many solutions does the system $y = x^2 + 2$ and $y = 1$ have?

- A. 1 solution
- B. 2 solutions
- C. infinitely many solutions
- D. 0 solutions

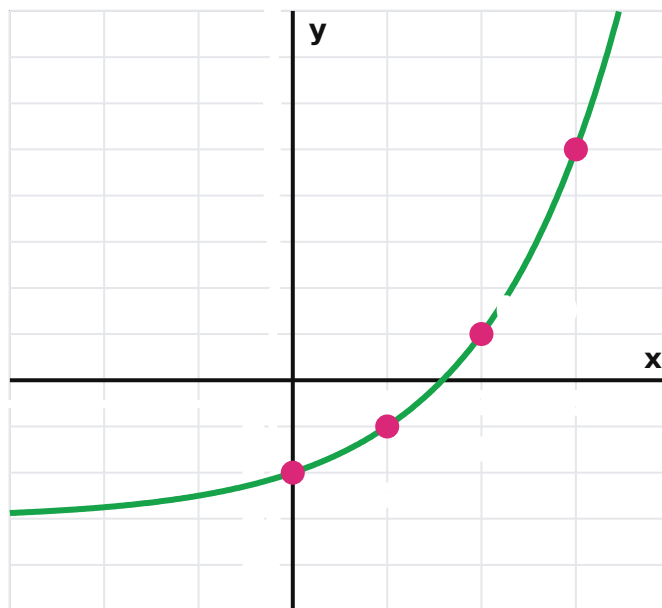
Question 5

What is the y-intercept of $y = 6\left(\frac{1}{2}\right)^x$?

- A. (0,0.5)
- B. (6,0)
- C. (0,1)
- D. (0,6)

Question 6

What is the horizontal asymptote of the graph of $y = 2^x - 3$?



The graph of $y = 2^x - 3$.

- A. $y = 0$
- B. $x = -3$
- C. $y = -3$
- D. $y = 3$

Question 7

What happens to $y = 3 \cdot 2^x$ as x gets very small (large and negative)?

- A. y gets very large and negative
- B. y approaches 3

- C. y gets very large and positive
- D. y approaches 0

Question 8

Which expression equals 4^x ?

- A. $2^{x/2}$
- B. 2^{2x}
- C. 2^{4x}
- D. 2^{x+2}

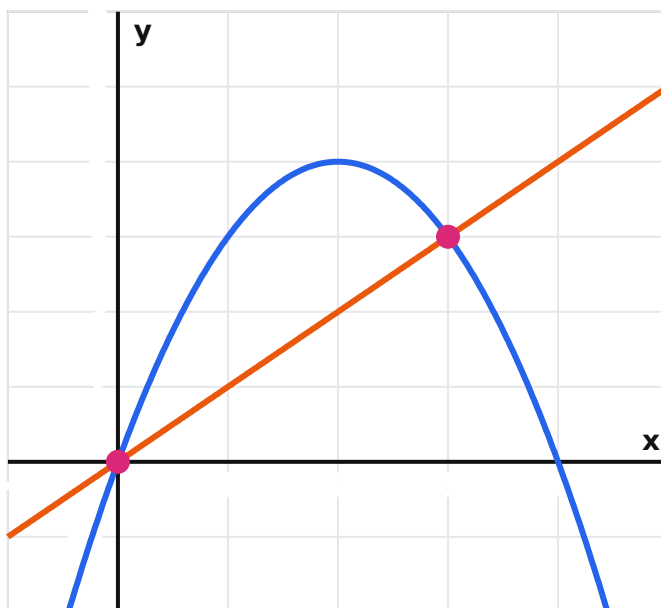
Question 9

An account grows by a factor of 1.08 each year. Using $1.08^t = (1.08^{1/12})^{12t}$, what is the monthly growth rate?

- A. about 0.67%
- B. about 6.4%
- C. about 0.64%
- D. about 0.08%

Question 10

A ball follows $y = -x^2 + 4x$ and lands on a ramp $y = x$. Besides the origin, where do the paths meet?



The ball path and the ramp.

- A. $(4,0)$
- B. $(3,3)$
- C. $(2,4)$
- D. $(1,3)$

Answer key

1. **C** - Substituting gives $3(3)-4=5$, which matches. Swapping the coordinates, as in $(5,3)$, is a common mistake.
2. **A** - The curves cross at $(-1,1)$ and $(2,4)$. Check: $(-1)^2=-1+2$ and $2^2=2+2$.
3. **A** - $x^2=3x+4$ gives $(x-4)(x+1)=0$, so $x=4$ or $x=-1$, and $y=x^2$ gives 16 and 1.
4. **D** - $x^2+2=1$ gives $x^2=-1$, which no real number satisfies, so the line never meets the parabola.
5. **D** - At $x=0$ the power is 1, so $y=6$. The base 0.5 is the decay factor, not the intercept.
6. **C** - The curve levels off at the shift, $y=-3$. Without the shift the asymptote would be $y=0$.
7. **D** - 2^x becomes a tiny positive number, so y gets close to 0 but stays positive.
8. **B** - $4=2^2$, so $4^x=(2^2)^x=2^{2x}$. Multiplying the exponents is the power rule.
9. **C** - $1.08^{1/12} \approx 1.0064$, a monthly rate of about 0.64%. Dividing 8% by 12 gives 0.67%, which ignores compounding.
10. **B** - $-x^2+4x=x$ gives $x(3-x)=0$, so $x=3$ and $y=3$. The point $(1,3)$ is only on the parabola.

Remember:

- Standards A-REI.D.10, A-REI.C.7, F-IF.C.7e and A-SSE.B.3c: graphs as solution sets, linear-quadratic systems, exponential graphs and rewriting exponentials.
- A point is on the graph of an equation exactly when its coordinates satisfy the equation.
- To solve a line-parabola system, set the two expressions for y equal, solve for x , then find y . There can be 2, 1 or 0 solutions.
- For $y=a \cdot b^x$ the y-intercept is $(0,a)$, there is no x-intercept, and the x-axis is an asymptote.
- Rewrite with $b^{mn}=(b^m)^n$: $1.15^t=(1.15^{1/12})^{12t}$ gives a monthly factor of about 1.0117.