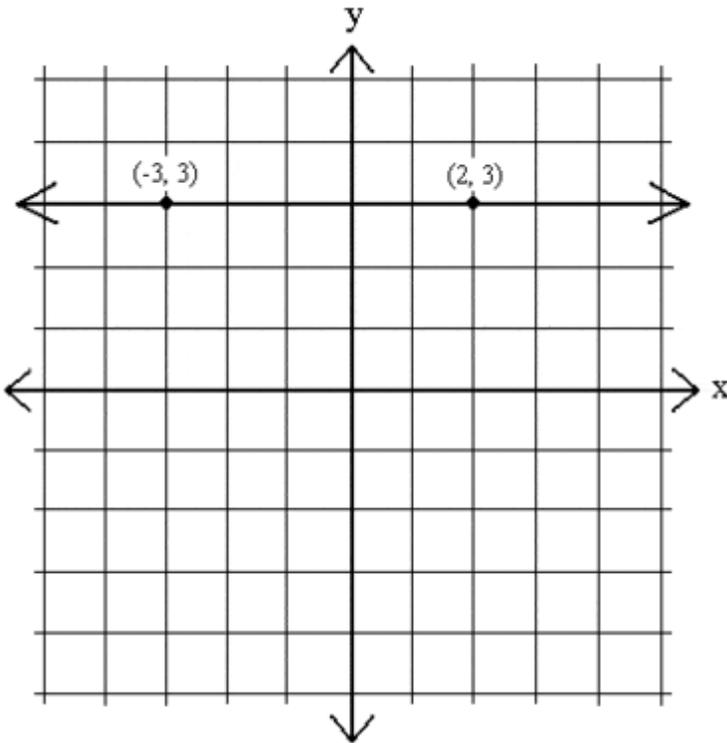


Pre-AP Algebra 1 Unit 3 – Quadratic Functions Practice Test

Question 1

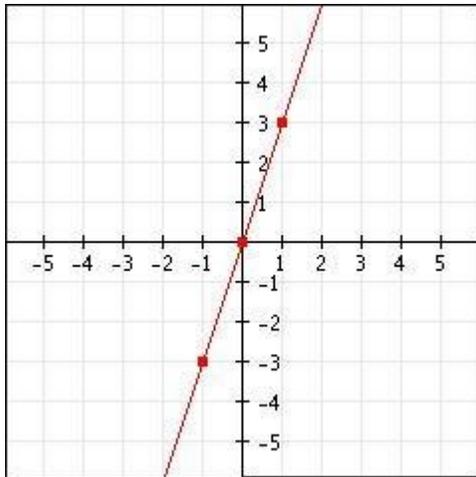
Find the rate of change from the graph.



- A. 0
- B. -3
- C. 3
- D. Undefined

Question 2

Find the rate of change:



- A.  $-1/3$
- B.  $1/3$
- C.  $-3$
- D.  $3$

Question 3

Find solutions to  $x^2+x-6=0$ .

- A.  $x=2,3$
- B.  $x=-6,1$
- C.  $x=-3,2$
- D.  $x=-1,6$
- E.  $x=-2,4$

Question 4

Solve for x.

$$3x^2+13x-4=-10+2x$$

- A.  $x = -12, -1$
- B.  $x = -4, -1$
- C.  $x = -9, -2$
- D.  $x = -2/3, -3$
- E.  $x = 4, 1$

Question 5

Solve for x.

$$7x^2 - 4x + 13 = 0$$

- A.  $x = \frac{2}{7} \pm \frac{\sqrt{87}}{7}$
- B.  $x = \frac{2}{7} \pm \frac{i\sqrt{87}}{7}$  correct answer
- C.  $x = \frac{\sqrt{87}}{7} \pm \frac{2}{7}$
- D.  $x = \frac{2i}{7} \pm \frac{i\sqrt{87}}{49}$

Question 6

**Billy is several years older than Johnny. Billy is one less than twice as old as Johnny, and their ages multiplied together make ninety-one. When will Billy be 1.5 times Johnny's age?**

- A. When Johnny is 14 and Billy is 21
- B. When Johnny is 12 and Billy is 18
- C. When Johnny is 7 and Billy is 13
- D. When Johnny is 2 and Billy is 3
- E. When Johnny is 4 and Billy is 6

Question 7

**A farmer is building a fence around a field. He knows that the length of the field is 11 meters more than twice its width. If he knows that the area of the field is 30 square meters, what is the perimeter, in meters, of the field?**

- A. 45
- B. 17
- C. 19
- D. 30
- E. 34

Question 8

**A construction worker tosses a brick from a tall building. The brick's height (in meters above the ground)  $t$  seconds after being thrown is modeled by**

$$h(t) = -5t^2 + 20t + 105$$

Suppose we want to know the height of the brick above the ground at its highest point. How far above the ground was the brick?

- A. 15 meters
- B. 100 meters
- C. 88 meters
- D. 125 meters
- E. 96 meters

Question 9

Tom started an entertainment company. The net value of the company (in thousands of dollars)  $t$  months after its creation is modeled by

$$v(t) = 4t^2 - 24t - 28$$

Tom wants to know when his company will be at its lowest net value.

How many months after its creation does the company reach its lowest net value?

- A. 1 month
- B. 3 months
- C. 2 months
- D. 5 months

Question 10

$$f(x) = x^2$$

$$g(x) = (x - 6)^2$$

We can think of  $g$  as a translated (shifted) version of  $f$ .

Complete the description of the transformation.

Use nonnegative numbers.

To get the function  $g$ , shift  $f$  \_\_\_\_\_ by \_\_\_\_\_ units.

- A. right; 6
- B. left; 6
- C. down; 2
- D. up; 6

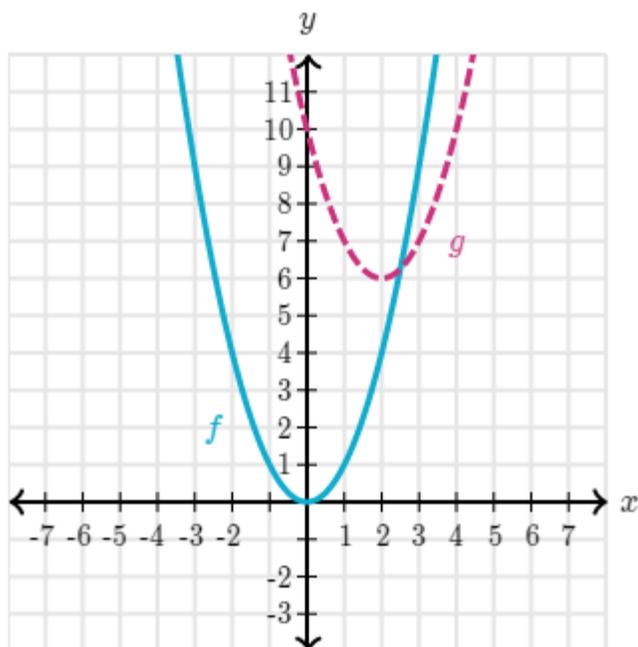
Question 11

The parabola  $y=x^2$  is shifted up by 4 units. What is the equation of the new parabola?

- A.  $y=4x^2$
- B.  $y=x^2+4$
- C.  $y=\frac{4}{x^2}$
- D.  $y=\frac{x^2}{4}$
- E.  $y=4-x^2$

Question 12

Function  $g$  can be thought of as a translated (shifted) version of  $f(x)=x^2$ .



What is the equation for  $g(x)$  ?

- A.  $g(x)=2x^2+6$
- B.  $g(x)=x^2+2x+6$
- C.  $g(x)=(x+2)^2+6$
- D.  $g(x)=(x-2)^2-6$
- E.  $g(x)=(x-2)^2+6$

Question 13

The parabola  $y=x^2$  is scaled vertically by a factor of 7.

What is the equation of the new parabola?

- A.  $y=-7x^2$
- B.  $y=7x^2$
- C.  $y=x^2+7$
- D.  $y=x^2-7$

Question 14

What is the missing constant term in the perfect square that starts with  $x^2+10x$  ?

- A. 5
- B. 2
- C. 9
- D. 16
- E. 25

Question 15

Imani and Todd were trying to solve the equation:

$$x^2+6x+5=8x$$

Imani said, "I can factor the left-hand side into  $(x+1)(x+5)$  , so I'll solve using the zero product property."

Todd said, "I can solve by completing the square. If I add 4 to each side, I can rewrite the equation as  $(x+3)^2=12$  ."

Whose solution strategy would work?

- A. Only Imani's
- B. Only Todd's
- C. Both
- D. Neither

Question 16

What is the minimum possible value of the expression below?

$$3x^2 + 6x - 10$$

- A. -10
- B. -13
- C. -19
- D. 7
- E. The expression has no minimum value.

Question 17

Which of the following is the correct solution when  $x^2 - 10x - 11 = 0$  is solved using the quadratic equation?

- A.  $\frac{10 \pm \sqrt{56}}{2}$
- B.  $\frac{10 \pm 12}{2}$
- C.  $10 \pm 12$
- D.  $\frac{-10 \pm 12}{2}$

Question 18

What is the vertex of the parabola  $y = 2(x - 3)^2 + 4$  ?

- A. (3,4)
- B. (-3,4)
- C. (3, -4)
- D. (-3,-4)

Question 19

What causes the graph of  $y = x^2$  to open downward?

- A. multiply the  $x^2$  by a fraction
- B. multiply the  $x^2$  by a decimal
- C. multiply the  $x^2$  by a negative number
- D. multiply the  $x^2$  by a number greater than 1

## Answer Key

1. A
2. D
3. C
4. D
5. B
6. B
7. E
8. D
9. B
10. A
11. B
12. E
13. B
14. E
15. B
16. B
17. B
18. A
19. C