

# Algebra 1

## REVIEW Unit 8 Test 2: Quadratics

Name: KEY

Date: \_\_\_\_\_ Period: \_\_\_\_\_

Don't forget to study your notes, old homework, and assessments from the first part of the unit!

- 1 Which ordered pair represents a solution to the function  $y = x^2 - 3x + 2$ ?

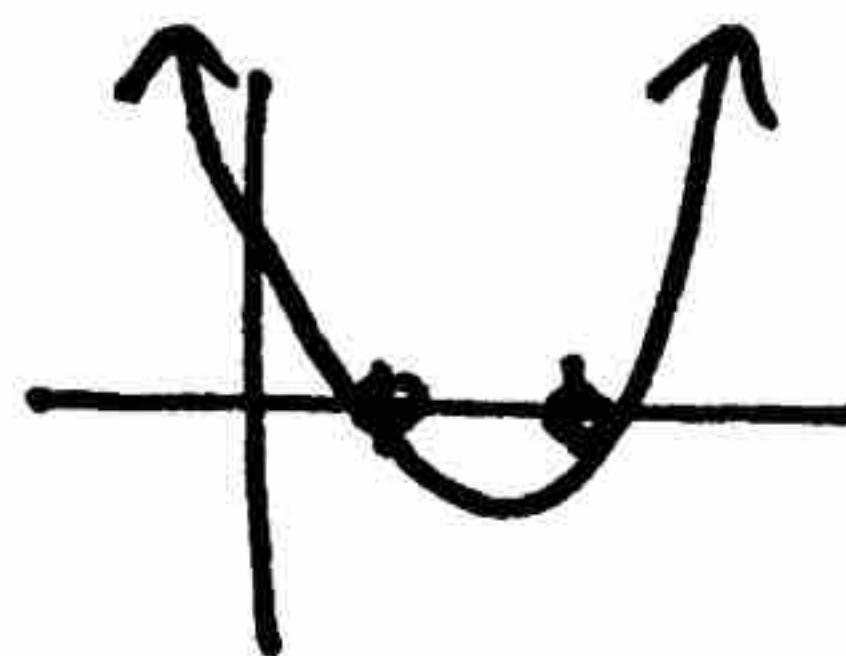
~~A~~ (2, 1)

~~B~~ (0, 1)

~~C~~ (0, 2)

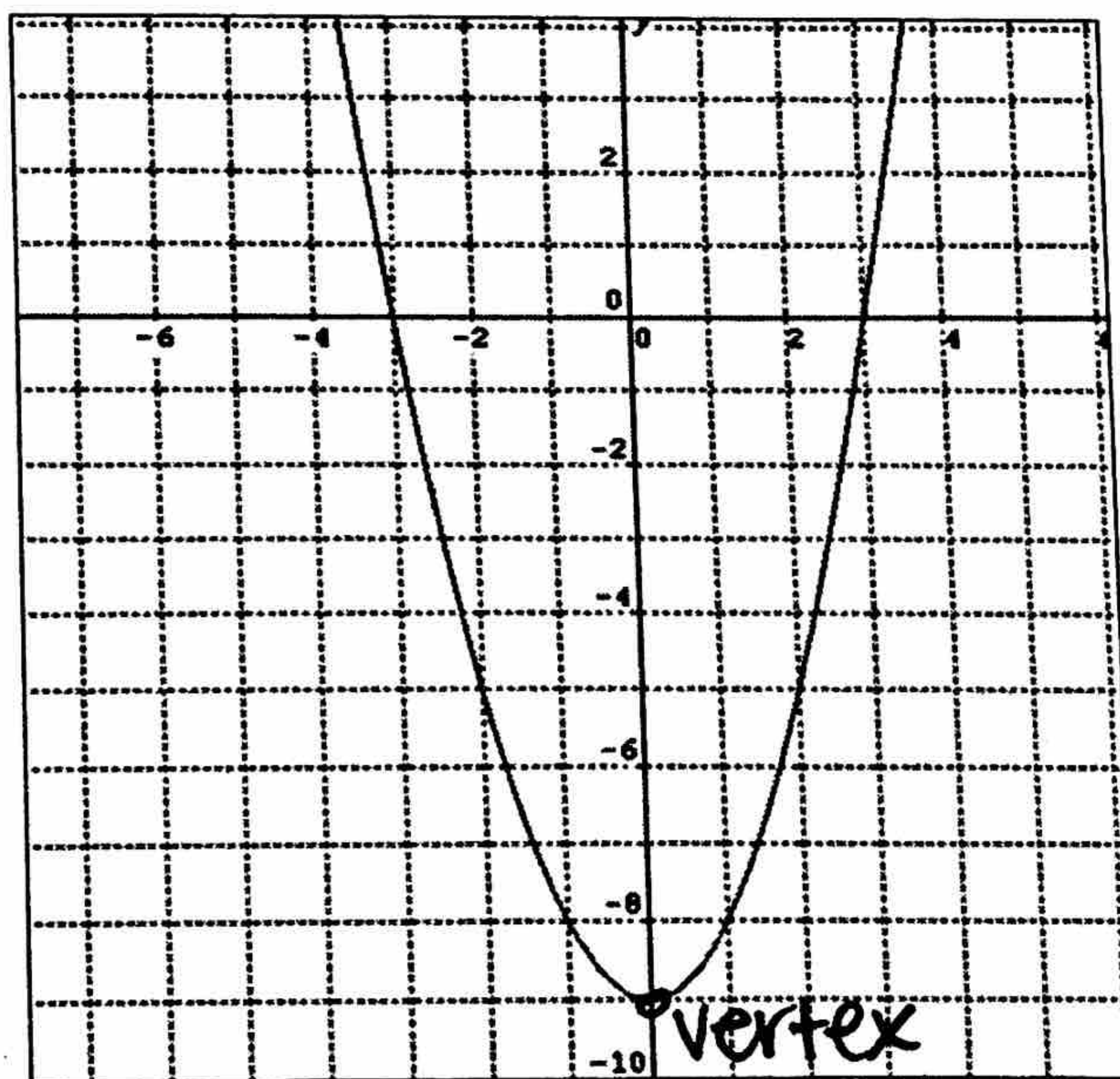
D (2, 0)

zeros  
roots  
x-intercepts  
 $y=0$



Graphing  
Factoring  
Quad. Form.

- 2 Zack studied the parabola shown below.



lowest point  $\rightarrow$  minimum

Zack made the following conclusions:

~~I.~~ The vertex is at (-9, 0). **Not on graph**

II. The vertex is at (0, -9). **✓**

III. The quadratic has a minimum value. **✓**

~~IV.~~ The quadratic has a maximum value.

~~V.~~ The axis of symmetry is x-axis.

**can't have both**  
**Y (never symmetric over x!)**

Which conclusions are correct?

A. I and IV

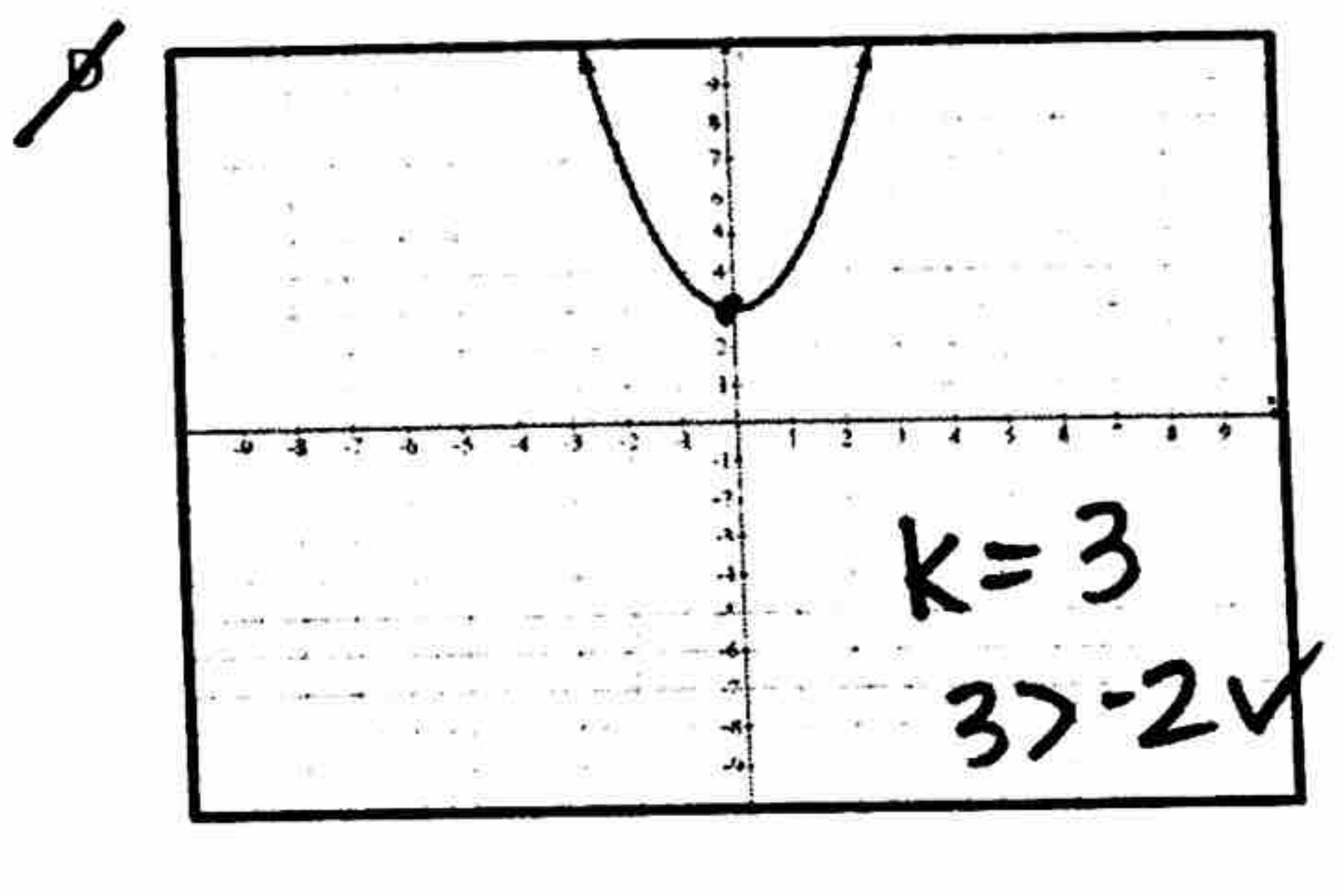
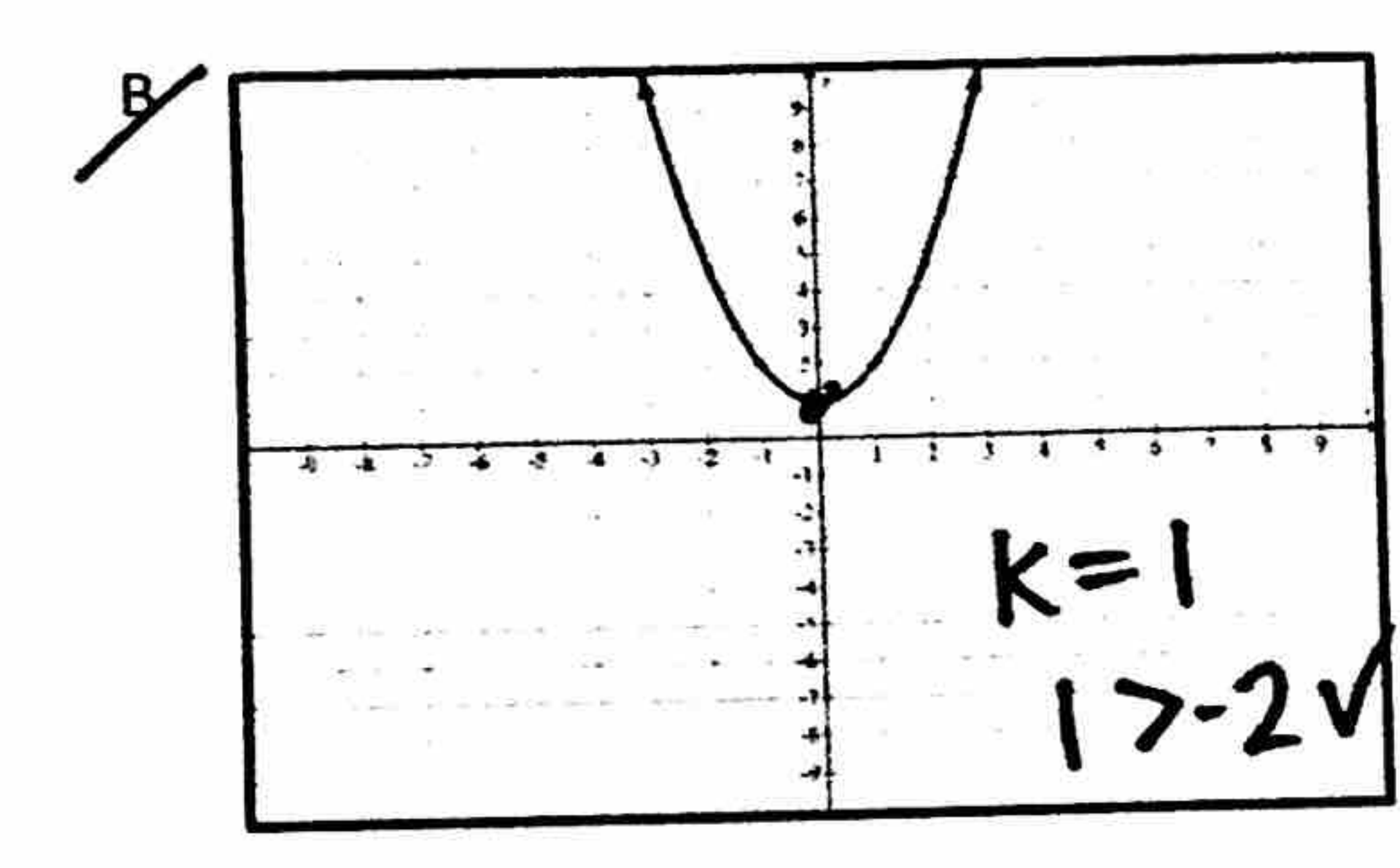
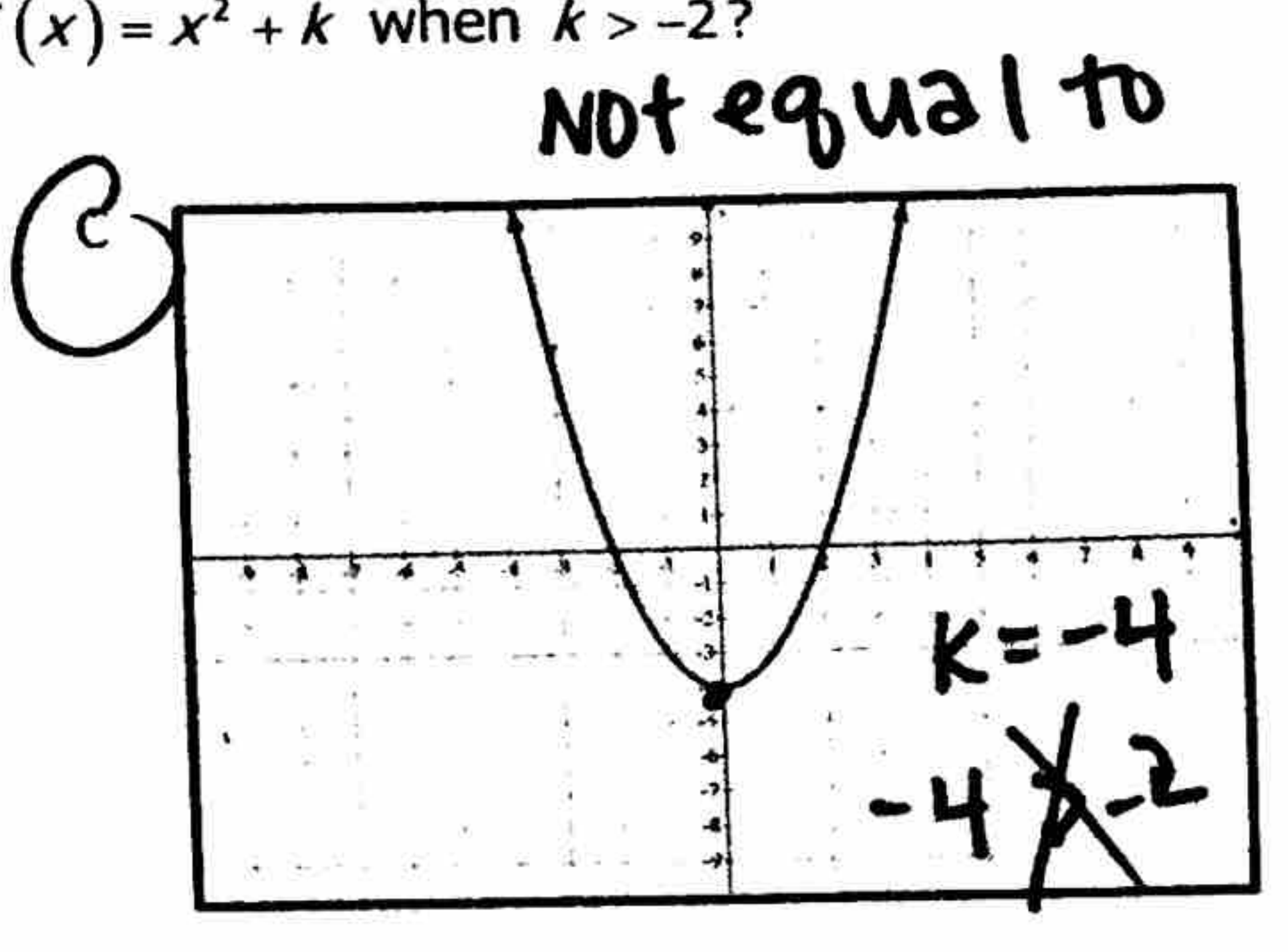
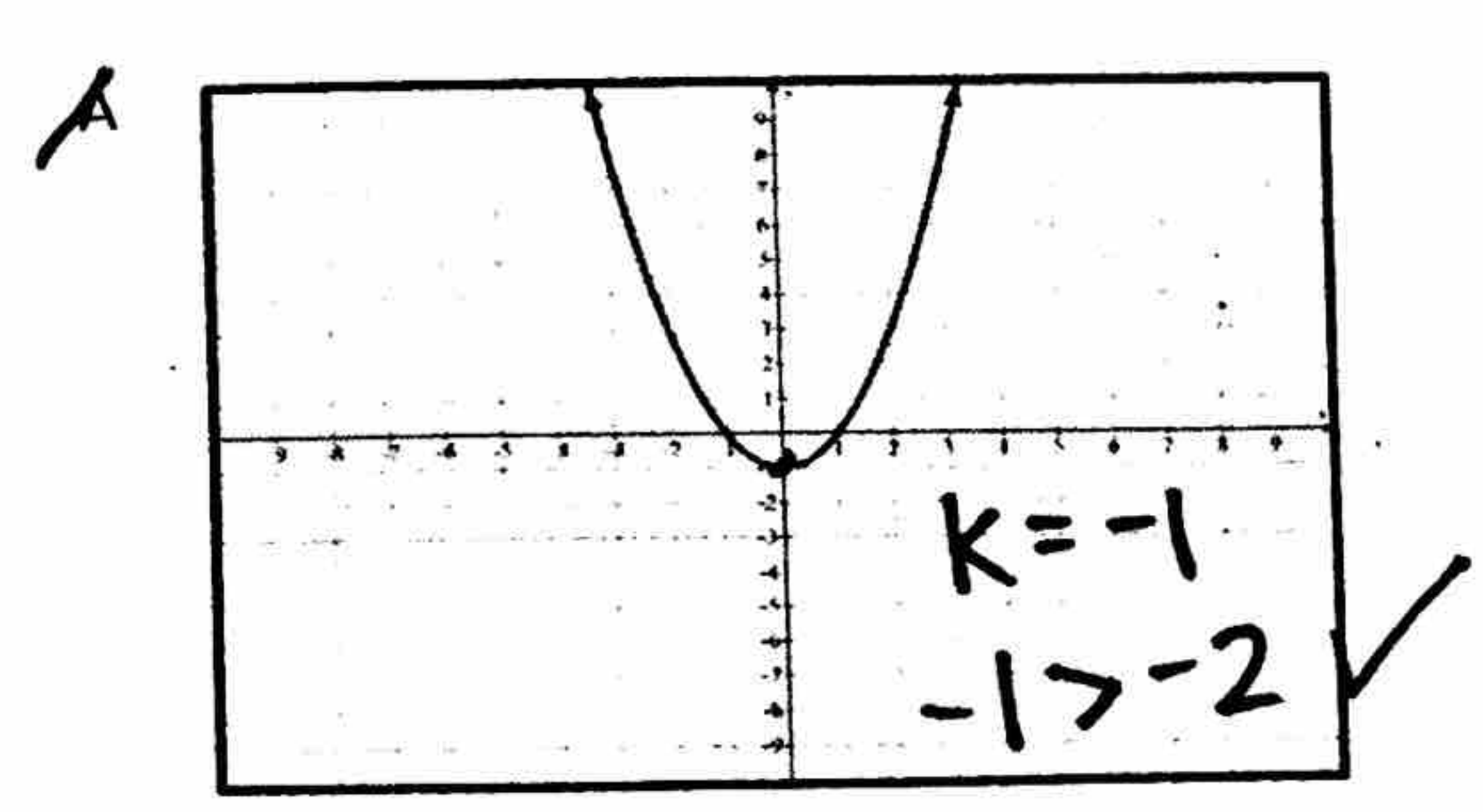
B. II and III

C. I, IV, and V

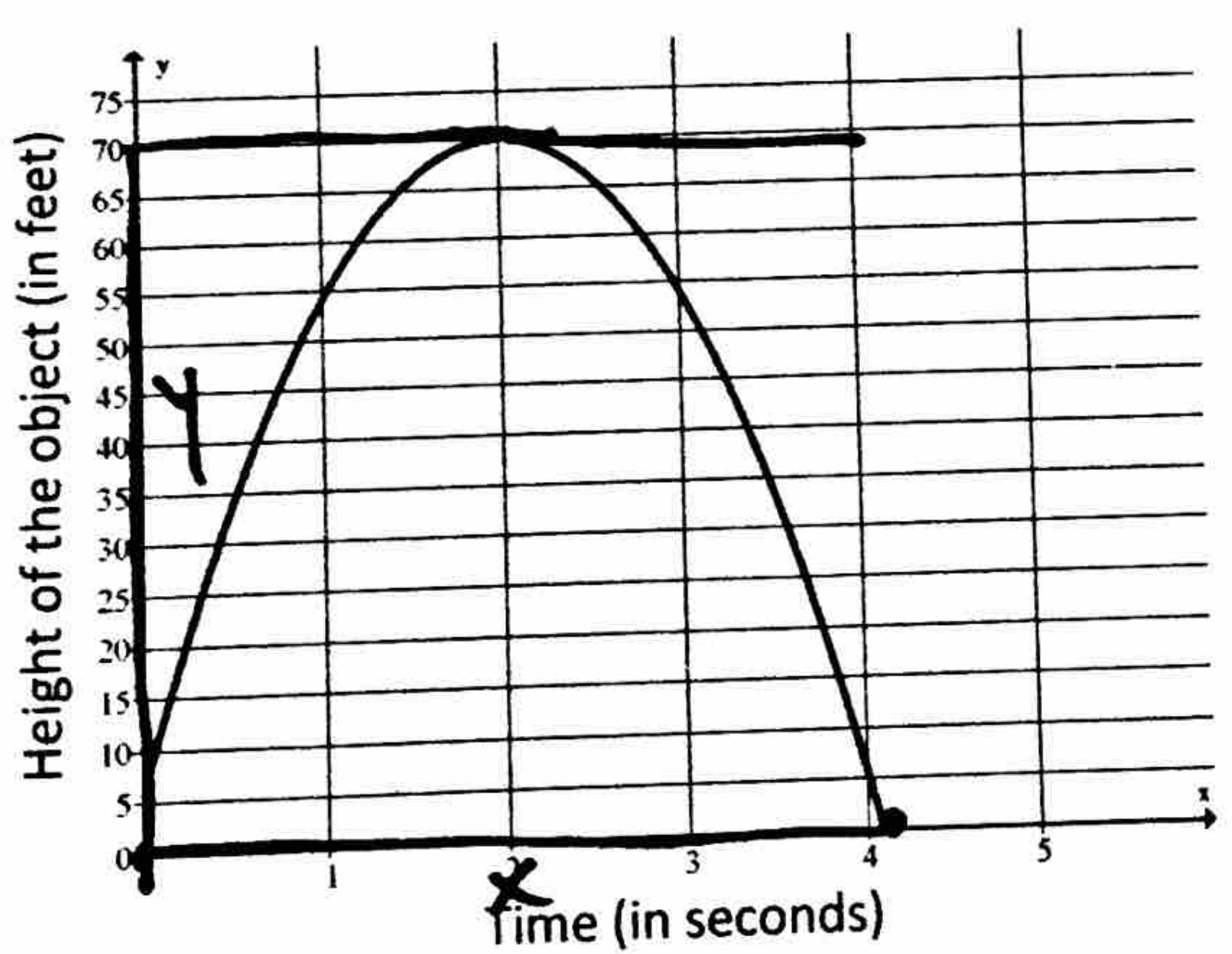
D. II, III, and V



3 Which of the following does not show a function  $f(x) = x^2 + k$  when  $k > -2$ ?



4 An object is launched straight up in the air. The height  $h$ , in feet, that the object travels is given by the equation  $h = -16t^2 + 64t + 6$ , where  $t$  is the time in seconds.



$D: 0 \leq x \leq 4.1$   
 $R: 0 \leq y \leq 70$

From the graph, what conclusion can be made about the launched object? Domain  $\rightarrow x$   
 Range  $\rightarrow y$

- F The domain is  $0 \leq x \leq 70$  and the range is  $0 \leq y \leq 4.1$
- ☒ G The domain is  $0 \leq x \leq 4.1$  and the range is  $0 \leq y \leq 70$
- ☒ H The domain is  $0 \leq y \leq 4.1$  and the range is  $0 \leq x \leq 70$
- ☒ J The domain is  $0 \leq y \leq 70$  and the range is  $0 \leq x \leq 4.1$



5. Which quadratic equation in standard form has the given roots  $x: \{2, -6\}$ ?

A.  $x^2 - 4x + 12$

B.  $x^2 + 4x + 12$

C.  $x^2 + 4x - 12$

D.  $x^2 - 4x - 12$

OR check answers in calculator!

$x = 2$  and  $x = -6$   
 $-2 \quad -2$   
 $x - 2 = 0$        $x + 6 = 0$   
 $(x - 2)(x + 6) = 0$

	$x$	$-2$
$x$	$x^2$	$-2x$
$+6$	$6x$	$-12$
	$x^2 + 4x - 12$	

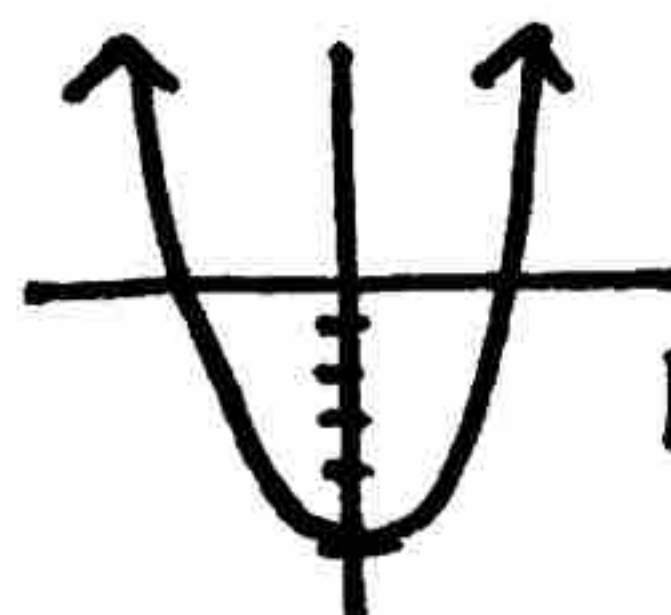
6. What is the range of  $f(x) = x^2 - 5$ ?

~~A~~ All real numbers

~~B~~ All real numbers greater than or equal to 5

C. All real numbers less than or equal to -5

D All real numbers greater than or equal to -5



Range:  $y$ 's

$y \geq -5$

↑ arrows point UP.

7 What is the solution set for the quadratic equation  $x^2 = 25$ ?

A {5}

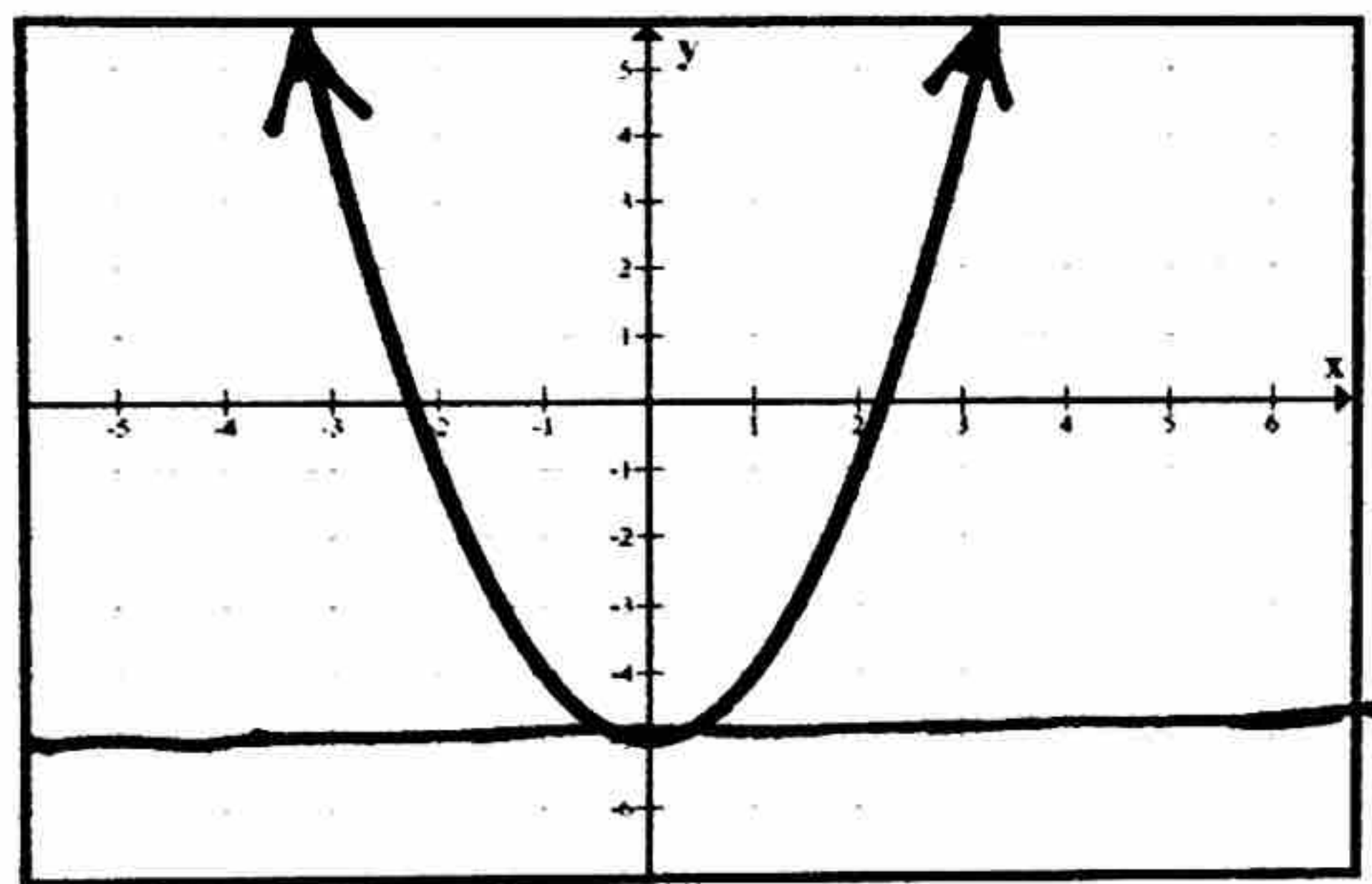
B {-5, 5}

C {625}

D {-625, 625}

NO plain  $x$ , can use square root method  
 $\sqrt{x^2} = \sqrt{25}$   
 $x = \pm 5$

8 State the domain and range of the graph shown below.



Arrows!

Domain is all real #s

Range:  $y \geq -5$

↑ arrows point up

F Domain: all Real numbers; Range  $y \geq -5$

G Domain: all Real numbers; Range  $y \leq -5$

~~H~~ Domain: all Real numbers; Range  $y \geq -5$

~~J~~ Domain: all Real numbers; Range  $y \leq -5$

9 Tommy graphed the parent function  $f(x) = x^2$ . He translated the graph of  $g(x)$  and 3 units up. Which function best represents his transformations?

2 units to the left  
 inside opposite  
 Add 2 to inside

~~X~~  $g(x) = f(x + 3) + 2$

~~X~~  $g(x) = f(x - 3) + 2$

C  $g(x) = f(x + 2) - 3$

D  $g(x) = f(x + 2) + 3$

Add 3 to outside



# square root in answer choices → use quadratic formula

10 What are the solutions to the equation  $x^2 - 3x = 6$ ?

$$x^2 - 3x - 6 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-3 \pm \sqrt{33}}{2}$$

$$x = \frac{3 \pm \sqrt{33}}{2}$$

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(-6)}}{2(1)}$$

$$= \frac{3 \pm \sqrt{33}}{2}$$

$$x = \frac{-3 \pm \sqrt{15}}{2}$$

$$x = \frac{3 \pm \sqrt{15}}{2}$$

11. Write the quadratic equation that has the given solutions:  $x: \left\{\frac{1}{2}, -3\right\}$

$$2 \cdot x = \frac{1}{2} \cdot 2 \text{ and } x = -3$$

$$2x = 1$$

$$x + 3 = 0$$

Factored form:  $y = (2x - 1)(x + 3)$

Standard form:  $y = 2x^2 + 5x - 3$

$$\begin{array}{r|rr} 2x & -1 & \\ \times & 2x^2 & -x \\ +3 & 6x & -3 \\ \hline & 2x^2 & +5x -3 \end{array}$$

12. What are the zeros of the equation  $3x^2 - 6x = 9$ ?

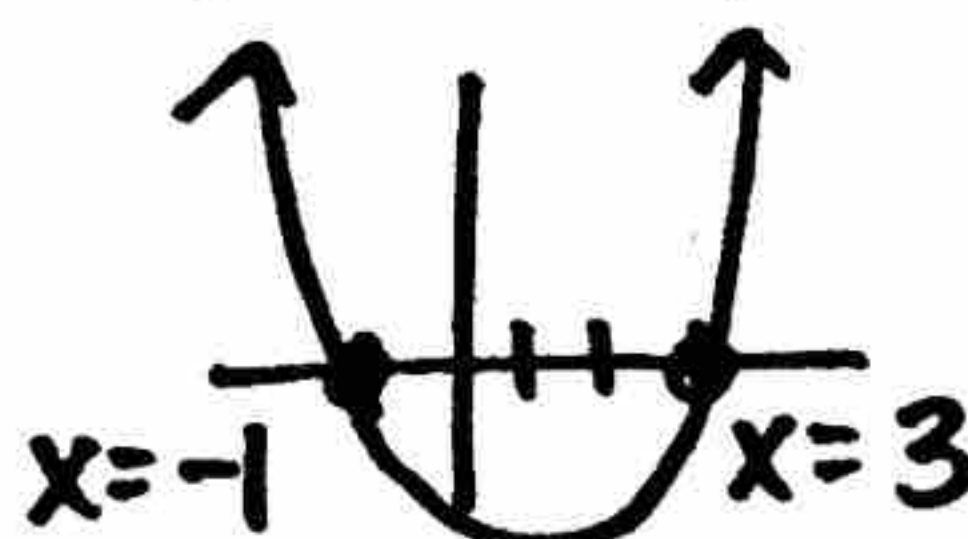
A.  $x: \{3, -1\}$

B.  $x: \{-3, 1\}$

C.  $x: \{2, 8\}$

D. No real solutions

$$3x^2 - 6x - 9 = 0$$



OR

$$3(x^2 - 2x - 3) = 0$$

$$(x-3)(x+1) = 0$$

$$\begin{array}{r|rr} x & -3 & \\ \times & x^2 & -3x \\ +1 & 1x & -3 \end{array}$$

$$\begin{array}{r|rr} -3 & & \\ \times & x^2 & -3x \\ +1 & 1x & -3 \end{array}$$

$$\begin{array}{l} x-3=0 \quad x+1=0 \\ +3 \quad +3 \quad -1 \quad -1 \\ \hline x=3 \quad x=-1 \end{array}$$

13. The amount of profit a travel agent will make is given by the formula  $P = 70n - n^2$ , where  $P$  is the amount of profit and  $n$  is the number of students who will take the trip. The graph at the right illustrates how the profit is dependent on the number of students.

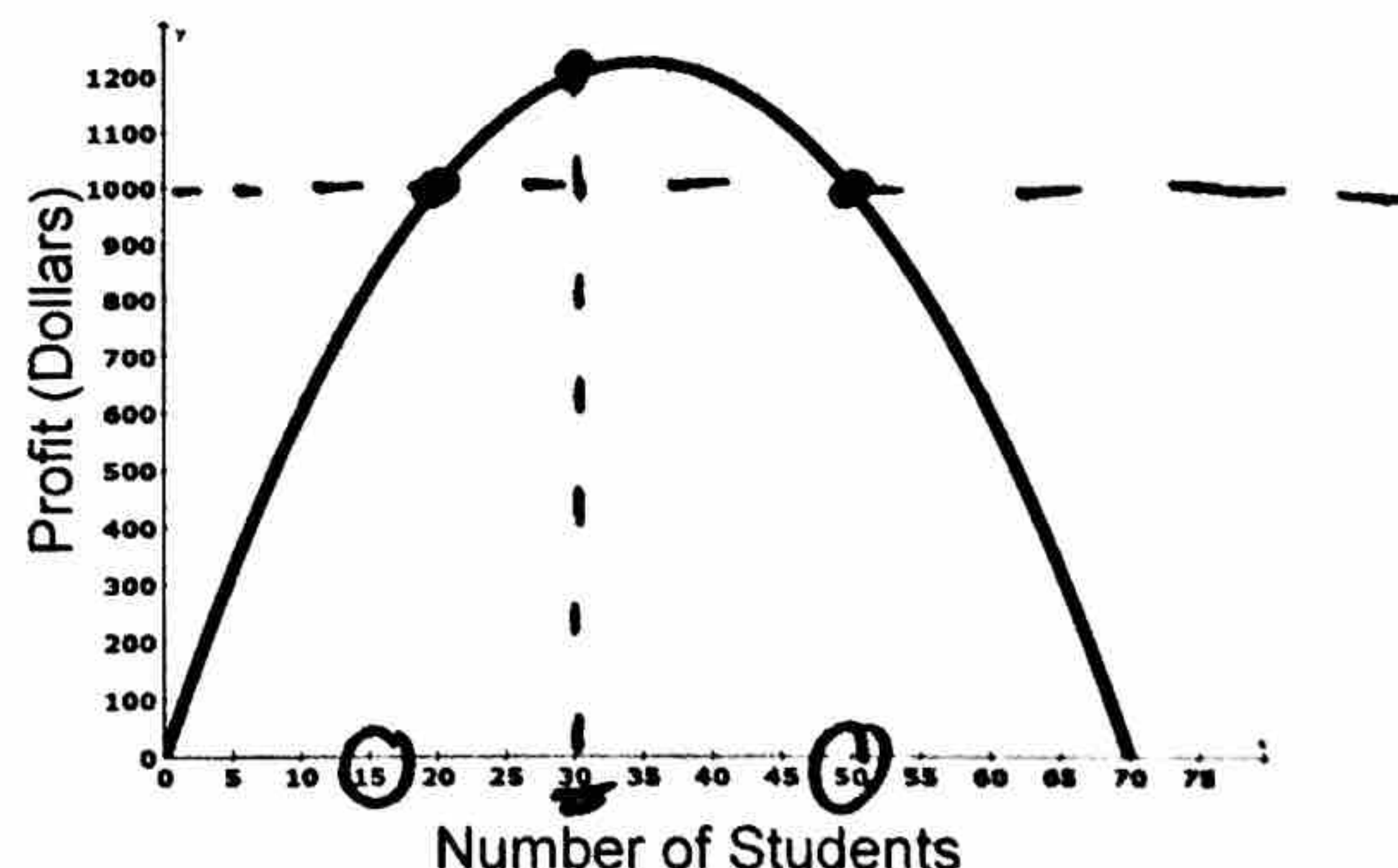
A. How many students must take the trip in order for the agent to earn at least \$1000?

money on y-axis between 15 and 50 students

B. What is the value of  $f(30)$ ?

$$x = 30$$

About \$1200



14. Simplify completely:  $\sqrt{96}$

$$\begin{array}{r} 96 \\ 1 \overline{) 96} \\ 2 \overline{) 48} \\ 3 \overline{) 32} \\ 4 \overline{) 24} \\ 6 \overline{) 16} \end{array}$$

$$\sqrt{16} \cdot \sqrt{6} = 4\sqrt{6}$$

15. Solve for the zeros of the function using the quadratic formula.

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

$$+4x \quad +4x$$

$$7 = 2x^2 + 4x$$

$$-7 \quad -7$$

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

$$a: 2$$

$$b: 4$$

$$c: -7$$

$$x = \frac{-4 \pm \sqrt{4^2 - 4(2)(-7)}}{2(2)}$$

$$x = \frac{-4 \pm \sqrt{72}}{4}$$

simplify square root

$$\begin{array}{l} \sqrt{72} = \sqrt{2 \cdot 36} \\ 32 = \sqrt{2} \cdot \sqrt{36} \\ 2 \overline{) 36} = 6\sqrt{2} \end{array}$$

$$\begin{array}{l} x = \frac{-4 \pm 6\sqrt{2}}{4} \\ \div 2 \div 2 \\ x = \frac{-2 \pm 3\sqrt{2}}{2} \end{array}$$