

# Algebra 1

Chapter 9

Section 9-7, 9-8

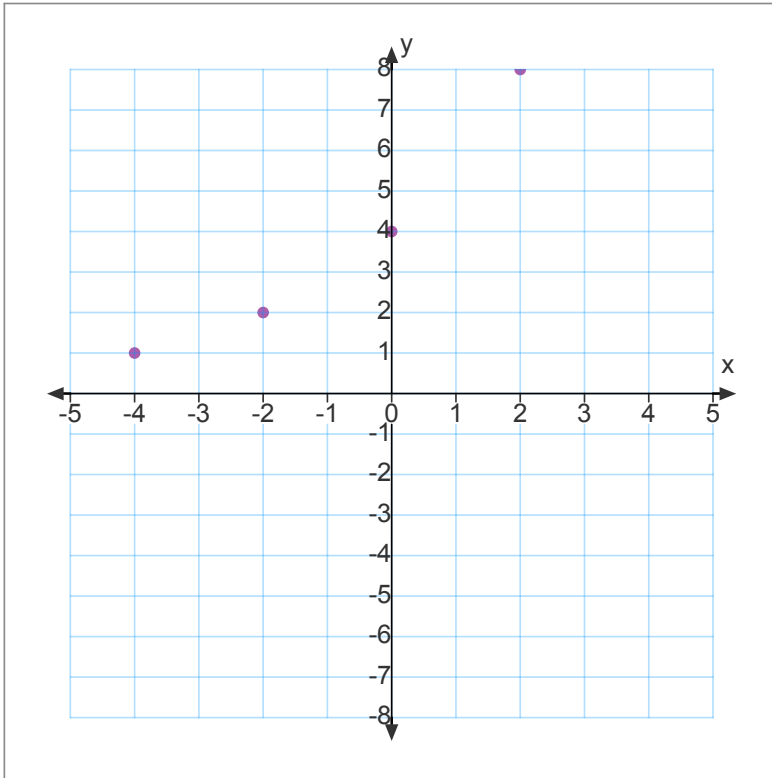
take note

**Concept Summary** Linear, Quadratic, and Exponential Functions

Linear:  $y = mx + b$

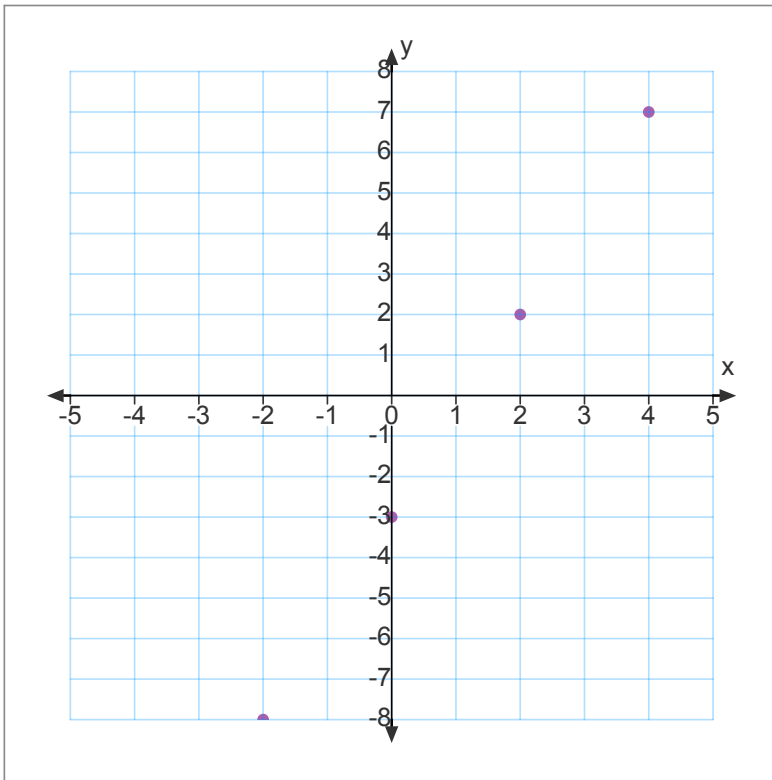
Quadratic:  $y = ax^2 + bx + c$

Exponential:  $y = a \cdot b^x$



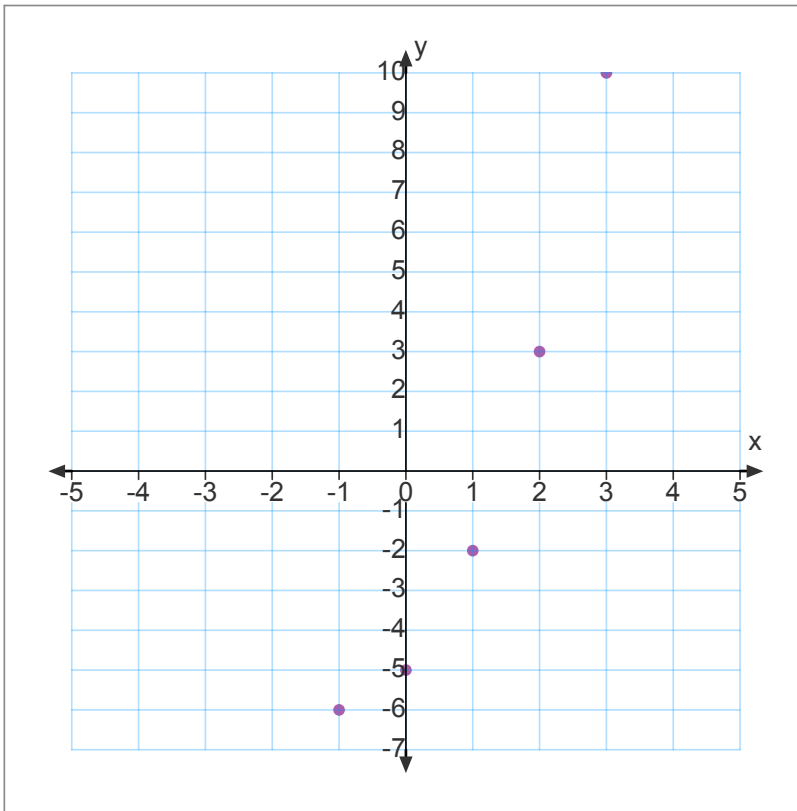
Determine if the relationship is linear, **exponential**, or quadratic.

| X  | Y |
|----|---|
| -4 | 1 |
| -2 | 2 |
| 0  | 4 |
| 2  | 8 |



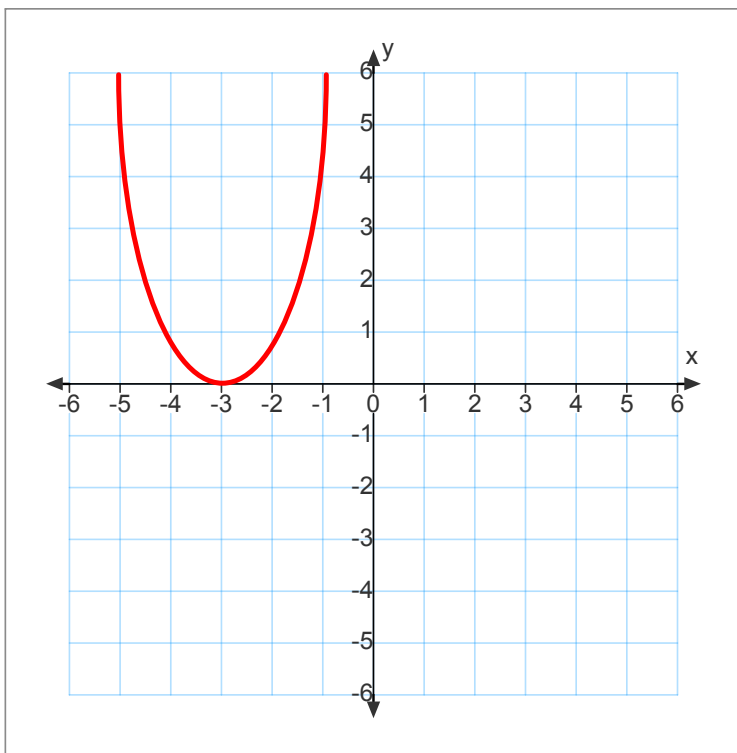
Determine if the relationship is **linear**, exponential, or quadratic.

| X  | Y  |
|----|----|
| -2 | -8 |
| 0  | -3 |
| 2  | 2  |
| 4  | 7  |



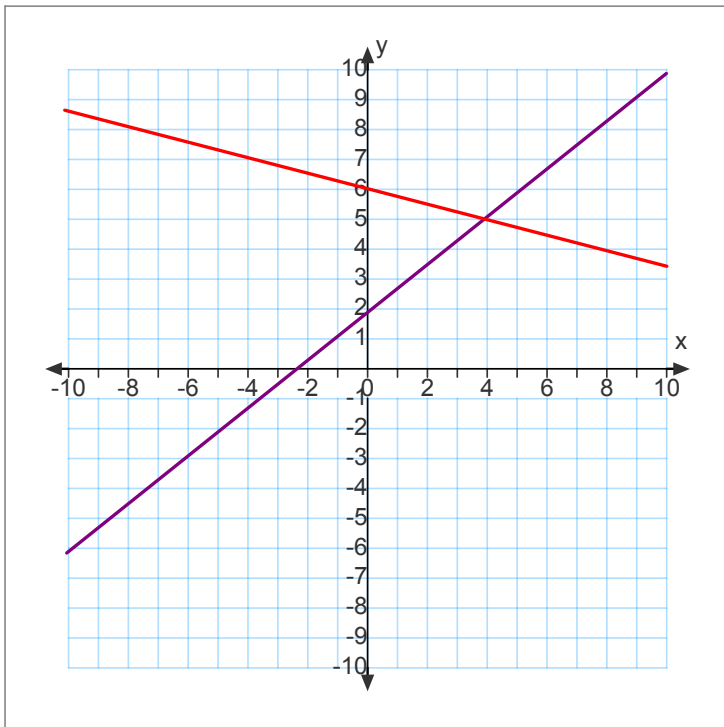
Determine if the relationship is linear, exponential, or **quadratic**.

| X  | Y  |
|----|----|
| -1 | -6 |
| 0  | -5 |
| 1  | -2 |
| 2  | 3  |
| 3  | 10 |



Draw a line that:

- a) intersects the parabola in two places.
- b) intersects the parabola in one place.
- c) does not intersect the parabola.



Where do the two lines intersect?

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$$3x + y = 10$$

$$y = -5x - 12$$

$$(-11, 43)$$

$$3x - 5x - 12 = 10$$

$$\underline{3x} - \underline{5x} = 22$$

$$\underline{-2x} = 22$$

$$x = -11$$

$$y = -5(-11) - 12$$

$$y = 55 - 12$$

$$y = 43$$



Where do the two lines intersect?

~~Square roots~~  $y = 2x^2 + 1x - 10$   
 \*Factoring & Zero  $-y = +4x + 12$   
 \*Quad  $0 = 2x^2 + 5x + 2$

$0 = 2x^2 + 1x + 4x + 2$   
 $0 = x(2x+1) + 2(2x+1)$   
 $0 = (2x+1)(x+2)$

$2x+1=0$   
 $-1 -1$   
 $\frac{2x}{2} = \frac{-1}{2}$   
 $x = -\frac{1}{2}$

$x+2=0$   
 $-2 -2$   
 $x = -2$

$y = +4(+\frac{1}{2}) - 12$   
 $y = 2 - 12$   
 $y = -10$

$y = -4x - 12$

$y = +4(-2) - 12$   
 $y = 8 - 12$   
 $y = -4$

$(-\frac{1}{2}, -10)$      $(-2, -4)$

Where do the two lines intersect?

$$x - 3y = 5$$

$$y = 2x^2 - 4$$

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

$$x = \frac{-1 \pm \sqrt{1^2 - 4(6)(7)}}{2(-6)}$$

$$x = \frac{-1 \pm \sqrt{169}}{-12}$$

$$x = \frac{-1 \pm 13}{-12}$$

$$\frac{-1 + 13}{-12} = \frac{12}{-12} = -1$$

$$\frac{-1 - 13}{-12} = \frac{-14}{-12} = \frac{7}{6}$$

$$x - 3(2x^2 - 4) = 5$$

$$x - 6x^2 + 12 = 5$$

$$-6x^2 + x + 7 = 0$$

$$a = -6, b = 1, c = 7$$