

Quadratics

GRUDGE BALL



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diRections

- Each team starts with 10 "X's"
- All teams will work on every question. One team will be chosen to provide the answer.
- If you answer the question correctly you get to erase two X's from another team. (You can erase one X from two different teams.)
- If you answer correctly you may also try to make a basket. If you make a 2-pointer you can take an additional two X's from another team. If you make a 3-pointer you can take 3!
- If you are out of X's you are not automatically out of the game. You can get a question correct and make a basket to get yourself 4 or 5 X's added!

Expand the following:

$$(3x + 1)(2x + 3)$$

$$6x^2 + 11x + 3$$

Quadratic or Not?

How do you know?

$$(x + 3)(x - 7)$$

Quadratic

When expanded the highest
exponent on x is 2.

What is the line of symmetry (LOS) for a parabola with the following x-intercepts?

$(-1, 0)$ and $(-4, 0)$

$$x = -2.5$$

Quadratic, Linear, Exponential, or Unknown:

How do you know?

x	y
2	1
3	4
4	9
5	16
6	25

constant

$\succ +3$
 $\succ +5$
 $\succ +7$
 $\succ +9$

$\succ +2$
 $\succ +2$
 $\succ +2$

Quadratic

The second difference
is constant.

Factor the following:

$$12x^2 + 40x$$

$$4x(3x + 10)$$

A rocket is launched and its height for any given time is modeled with a quadratic equation.

Which Key Feature will tell us how long it will take for the rocket to return to the ground?

2nd x-intercept

What are the x-intercepts?

$$(x + 4)(5x - 3)$$

$(-4, 0)$ $(3/5, 0)$

Expand the following:

$$(4x - 1)(x - 3)$$

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

Quadratic or Not?

How do you know?

$$4x^2 - 3x + 2$$

Quadratic

The highest exponent
on x is 2.

What is the line of symmetry (LOS) for a parabola with the following x–intercepts?

$(1, 0)$ and $(6, 0)$

$$x = 3.5$$

Quadratic, Linear, Exponential, or Unknown:

How do you know?

x	y
2	1
3	2
4	4
5	8
6	16

Exponential

There is a constant
growth factor.

Factor the following:

$$x^2 + 8x + 15$$

$$(x + 5)(x + 3)$$

A rocket is launched and its height for any given time is modeled with a quadratic equation.

Which Key Feature will tell us the highest the rocket was above the ground?

y value of the Vertex

What are the x-intercepts?

$$(2x + 1)(x - 3)$$

$(-1/2, 0)$ $(3, 0)$

Expand the following:

$$(2x + 3)(5 - x)$$

$$-2x^2 + 7x + 15$$

Factor the following:

$$5x^2 + 7x + 2$$

$$(5x + 2)(x + 1)$$

Quadratic or Not?

How do you know?

$$2x^2 + 2x(4 - x)$$

NOT Quadratic

When expanded it is linear.

What is the line of symmetry (LOS) for a parabola with the following x-intercepts?

$(-8, 0)$ and $(10, 0)$

$$x = 1$$

Quadratic, Linear, Exponential, or Unknown:

How do you know?

x	y
2	1
3	4
4	9
5	4
6	1

Unknown

No constant slope,
constant 2nd difference or
constant factor.

Factor the following:

$$x^2 - 7x + 12$$

$$(x - 3)(x - 4)$$

A rocket is launched and its height for any given time is modeled with a quadratic equation.

Which Key Feature will tell us how high the launch pad was?

y – intercept

What are the x-intercepts?

$$(x + 5)(-x + 2)$$

$(-5, 0)$ $(2, 0)$

Expand the following:

$$(2x + 1)(x^2 + 3x + 2)$$

$$2x^3 + 7x^2 + 7x + 2$$

Quadratic or Not?

How do you know?

$$3x^3 + 5x^2 + x - 3$$

NOT Quadratic

The highest exponent
on x is 3.

What is the line of symmetry (LOS) for a parabola with the following x-intercepts?

$(-5, 0)$ and $(5, 0)$

$$x = 0$$

Quadratic, Linear, Exponential, or Unknown:

How do you know?

x	y
2	1
3	4
5	10
8	19
9	22

Linear

There is a constant slope
between all points.

Factor the following:

$$15x^2 + 11x + 2$$

$$(3x + 1)(5x + 2)$$

A rocket is launched and its height for any given time is modeled with a quadratic equation.

Which Key Feature will tell us **how long** it took the rocket to reach its highest point?

Line of Symmetry

What are the x-intercepts?

$$3x(x + 4)$$

$(0, 0)$ $(-4, 0)$

Expand the following:

$$5x(3x + 4)$$

$$15x^2 + 20x$$

Quadratic or Not?

How do you know?

$$4x(x - 7)$$

Quadratic

When expanded the highest
exponent on x is 2.

What is the line of symmetry (LOS) for a parabola with the following x–intercepts?

$(2, 0)$ and $(10, 0)$

$$x = 6$$

Quadratic, Linear, Exponential, or Unknown:

How do you know?

x	y
2	2
3	4
4	10
5	20
6	34

Quadratic

The second difference
is constant.

Factor the following:

$$2x^2 - 5x - 12$$

$$(2x + 3)(x - 4)$$

What are the x-intercepts?

$$(x + 3)(x - 2)$$

$(-3, 0)$ $(2, 0)$
