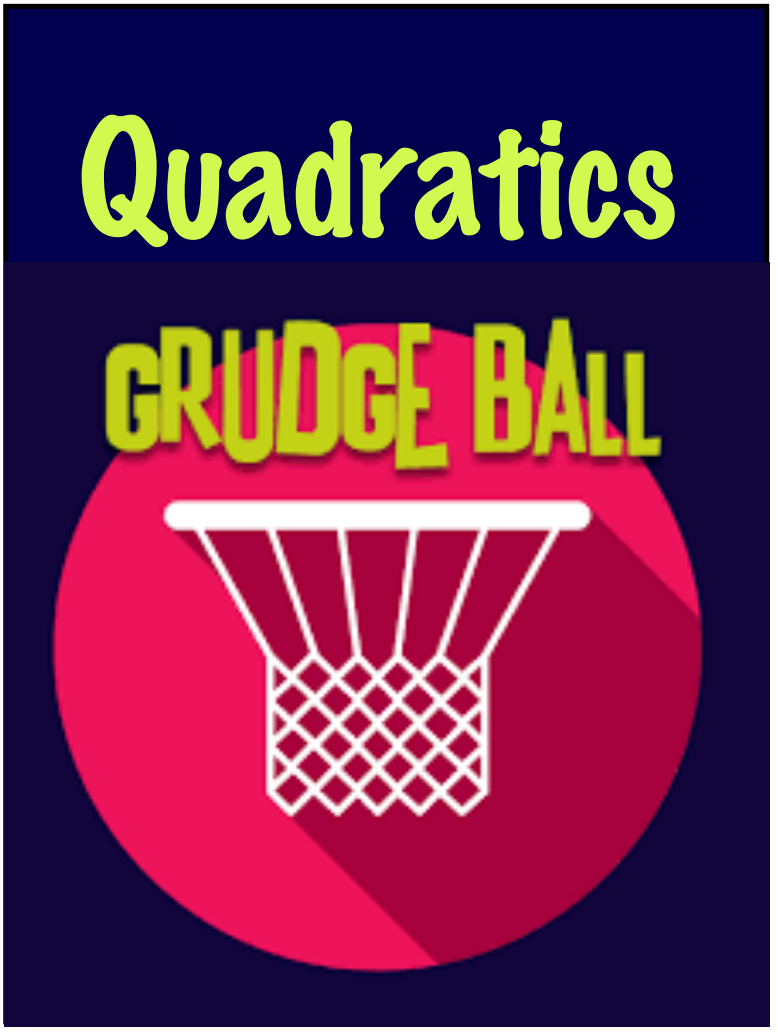
Quadratics



GRUDGE BALL
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 earn two points. You can add X's to your score, or 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/add an additional two X's. If you make a 3-pointer you can take/add 3!
- If you are out of X's you are not automatically out of the game. You can get a question correct and start adding points again.

Expand the following:

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

$$\boxed{6x^2 + 11x + 3}$$

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

Quadratic

The second difference is constant.

Factor the following:

$$12x^2 + 40x$$

$$\boxed{4x(3x + 10)}$$

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?

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

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

Expand the following:

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

$$\boxed{4x^2 - 13x + 3}$$

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:

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

$$\boxed{(x + 5)(x + 3)}$$

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?

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

$$\boxed{\left(-\frac{1}{2}, 0\right) \quad (3, 0)}$$

Expand the following:

$$(2x + 3)(5 – x)$$

$$\boxed{–2x^2 + 7x + 15}$$

Factor the following:

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

$$\boxed{(5x + 2)(x + 1)}$$

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?

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

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

Expand the following:

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

$$\boxed{2x^3 + 7x^2 + 7x + 2}$$

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:

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

$$\boxed{(3x + 1)(5x + 2)}$$

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?

$3x(x + 4)$

$(0, 0) \quad (-4, 0)$

Expand the following:

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

$$\boxed{15x^2 + 20x}$$

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:

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

$$\boxed{(2x + 3)(x - 4)}$$

What are the x-intercepts?

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

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

What is the y-intercepts?

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

$(0, -6)$