3.2 Quadrating Relations

A quadratic function's equation that can be written in the form

y = _____,

where , b, and c are constants and a cannot = 0.

$y = ax^2 + bx + c = 0$
$y = a(0)^2 + bx + c = 0$
$y = bx + c$ This is a _____ relation

Here are 3 examples of quadratic relations; state the values of a, b, and c.
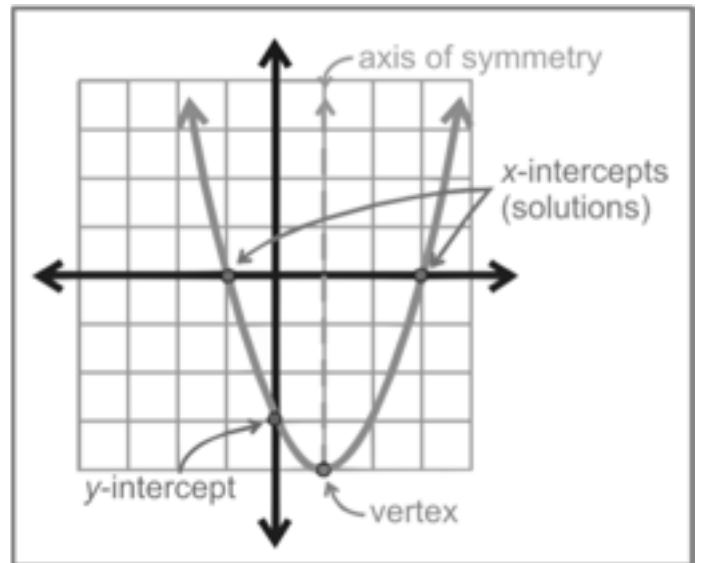
$y = 2x^2 + 3x + 1 = 0$ $y = 5x^2 - 4 = 0$ $y = x^2$

Features of Quadratics

- The _____ of a parabola is

either the _____ point (opens up)

or the _____ point (opens down).

- A vertical line of symmetry which goes

through the vertex is called the

_____

- The x-intercept(s) of a parabola are called its

_____ or roots.

How can you tell if data in linear?

Look at the data from last class

side lengths	number of toothpicks
0	0
1	3
2	9
3	18
4	30
5	45

Linear Relation: If a relation has constant _____ differences i.e. (slope) the relation is linear.

Quadratic Relation: If a relation has constant _____ differences the relation is quadratic.

Calculate the first and second differences to determine whether the relation is linear, quadratic or neither.

x	y
-1	5
0	7
1	9
2	11
3	13

x	y
-2	3
-1	-3
0	5
1	-3
2	3

x	y
-3	7
0	4
3	1
6	-2
9	-5

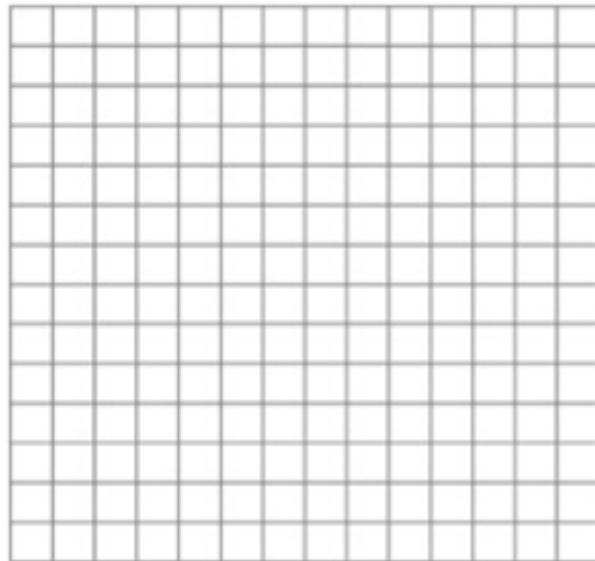| x	y
1	4
2	6
3	12
4	18
5	28

Application

The path of a golf ball is modelled by the equation $y = -x^2 + 5x$ where x represents the horizontal distance travelled by the ball in meters and y represents the height of the ball in meters.

a) Complete the table of values and graph the relation

x	y

b) Determine the coordinates 0f the vertex

c) What was the maximum height of the ball?

d) How far away does the ball land?

e) What was the height of the ball 4m away from the golfer?