

FOLDABLE

Day 6

Non Linear Relations

Definition

Comparison

Extra Step for Graphing

Parabolas

Jan 10-2:05 PM

NON- Linear Relation

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An equation whose graph is not a straight line.

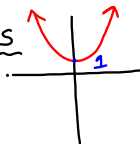
Linear	Non Linear
$x+y=10$	$y=x^2$
$y=2x$	$x^2+y^2=1$
$y=-3x-7$	$y=x^3$
Degree 1 (exponent on variable is 1.)	Degree 2 or higher exponent on at least 1 is 2 or higher

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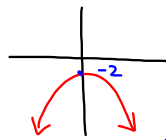
* When graphing, we need more than 3 x-values (ideally at least 5).

CHOOSE -2, -1, 0, 1, 2 for x-values

Parabolas



Equation: $y=x^2+1$
 D: $x \in \mathbb{R}$
 R: $1 \leq y < \infty$
 $y \geq 1, y \in \mathbb{R}$



Equation: $y=-x^2-2$
 D: $x \in \mathbb{R}$
 R: $-\infty \leq y \leq -2$
 $y \in \mathbb{R}$
 $y \leq -2$

Jan 11-10:48 AM

Example 1: Graph the following relations given the domain is ALL REAL NUMBERS

- a. $y=x^2$
- b. $y=x^2+3$
- c. $y=-x^2+4$
- d. $y=-x^2-2$
- e. $y+5=x^2$
- f. $y=2x^2-x-5$

FOLDABLE Steps for Graphing

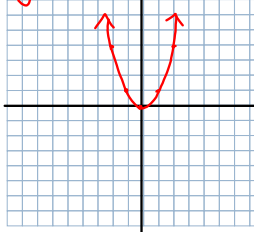
1. Make a table of values.
2. Rearrange equation to $y=$
3. Solve for range using the given domain.
4. Plot points.
5. Connect.

Nov 22-1:29 PM

$y=x^2$

x	$y=x^2$	(x,y)
-2	$(-2)^2=4$	(-2,4)
-1	$(-1)^2=1$	(-1,1)
0	$0^2=0$	(0,0)
1	$1^2=1$	(1,1)
2	$2^2=4$	(2,4)

Range: $0 \leq y < \infty; y \in \mathbb{R}$



Domain: $x \in \mathbb{R}$

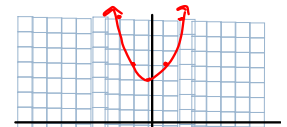
Range:

$0 \leq y < \infty, y \in \mathbb{R}$

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$y=x^2+3$

x	$y=x^2+3$	(x,y)
-2	$(-2)^2+3=7$	(-2,7)
-1	$(-1)^2+3=4$	(-1,4)
0	$0^2+3=3$	(0,3)
1	$1^2+3=4$	(1,4)
2	$2^2+3=7$	(2,7)



Domain: $x \in \mathbb{R}$

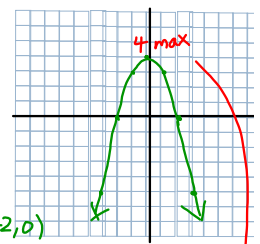
Range:

$3 \leq y < \infty, y \in \mathbb{R}$

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$y=-x^2+4$

x	$y=-x^2+4$	(x,y)
-2	$-1(-2)^2+4=0$	(-2,0)
-1	$-1(-1)^2+4=3$	(-1,3)
0	$-1(0)^2+4=4$	(0,4)
1	$-1(1)^2+4=-1+4=3$	(1,3)
2	$-1(2)^2+4=0$	(2,0)
3	$-1(3)^2+4=-5$	(3,-5)



Domain:

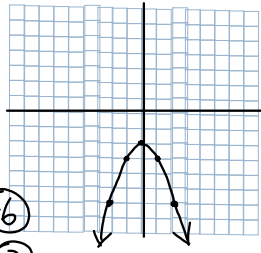
Range:

$-\infty \leq y \leq 4, y \in \mathbb{R}$

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$y = -x^2 - 2$



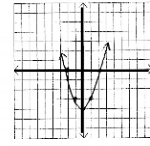
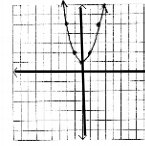
x	y = -x ² - 2
-2	-1(-2) ² - 2 = 4 - 2 = -6
-1	-1(-1) ² - 2 = -1 - 2 = -3
0	-1(0) ² - 2 = -2
1	-1(1) ² - 2 = -1 - 2 = -3
2	-1(2) ² - 2 = -4 - 2 = -6

Domain: $x \in \mathbb{R}$
 Range: $-\infty \leq y \leq -2$
 $y \in \mathbb{R}$

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$y = x^2 + 1$ Range: $y \geq 1$ $y = x^2 - 4$ Range: $y \geq -4$

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



x	y
-2	0
-1	-3
0	-4
1	-3
2	0

Nov 29-6:18 PM