

Vocabulary: Linear - The equation, table, or graph make a straight line when graphed.

Table

CROC

x y



Equation

$y = mx + b$
 $Ax + By = c$

GRAPH

CROC
 No curves
 No corners

Show whether each set of tables represents a linear relationship by finding several slopes. For each linear relationship write an equation in slope-intercept form.

Ex. 1:

	x	y	
+1	0	2	+2
+1	1	4	+2
+1	2	6	+2
+1	3	8	+2

LINER

$\frac{2}{1}$
 CROC: $\frac{2}{(m)}$

$y = mx + b$
 $y = 2x + 2$

(b) → when $x = 0$

Ex. 2:

	x	y	
+1	-1	1	-1
+4	0	0	+16
+6	4	16	+84
	10	100	

NON-LINER

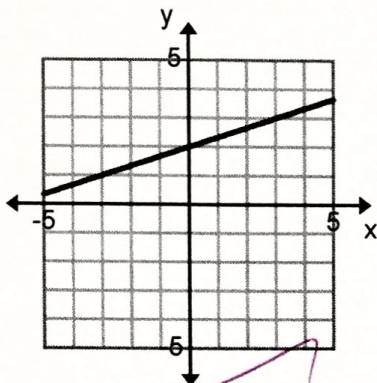
$\frac{-1}{1}$ $\frac{16}{4}$ $\frac{84}{6}$

$-1 \neq 4 \neq 14$

No CROC

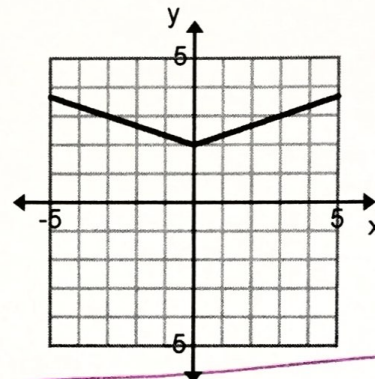
Determine whether the following graphs and equations are linear, or not linear.

Ex. 3:



LINEAR

Ex. 4:



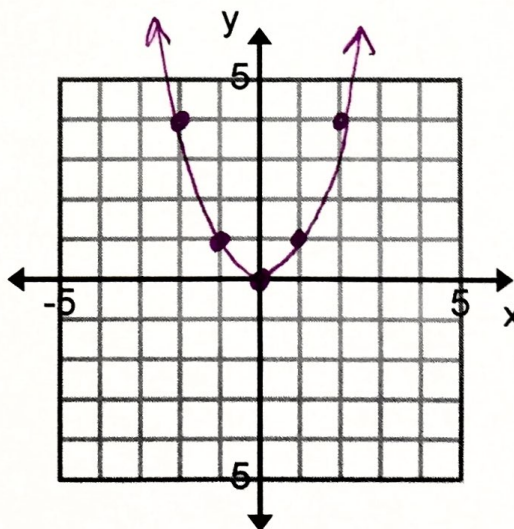
NON-LINEAR

Make a table of values for the following equation and determine whether the equation represents a linear relationship.

Ex. 5: $y = x^2 + 0$

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

NON-LINEAR



What are the characteristics of Linear equations?

Straight Line

No curves, No corners

$$y = mx + b$$

Doesn't have weird stuff happening to x

$$Ax + By = C$$

CROC

What are the characteristics of Non-Linear equations?

Curves / corners

$$x^2$$

$$x^3$$

$$\frac{5}{x}$$

No CROC

$$|x|$$

$$\sqrt{x}$$

Determine whether each equation is linear or non-linear.

Ex. 6: $y = \frac{1}{2}x + 5$

LINEAR

Ex. 9: $y = \frac{x}{2} + 5$

LINEAR

Ex. 7: $y = 2x^2 + 5$

NON-LINEAR

Ex. 10: $y = -x + 0$

LINEAR

Ex. 8: $y = 2|x| + 5$

NON-LINEAR

Ex. 11: $y = 2\sqrt{x} + 5$

NON-LINEAR