Algebra I

8-8
Linear and Quadratic Functions

Linear Equation — $y = mx + b$

Linear Function-

$\underset{\text{output}}{F(x)} = mx + b$ input

$\hookrightarrow$ y-intercept

$\hookrightarrow$ slope

$\hookrightarrow$ no powers on x or y

Linear functions all graph into straight lines.

Quadratic Function- $g(x) = ax^2 + bx + c$

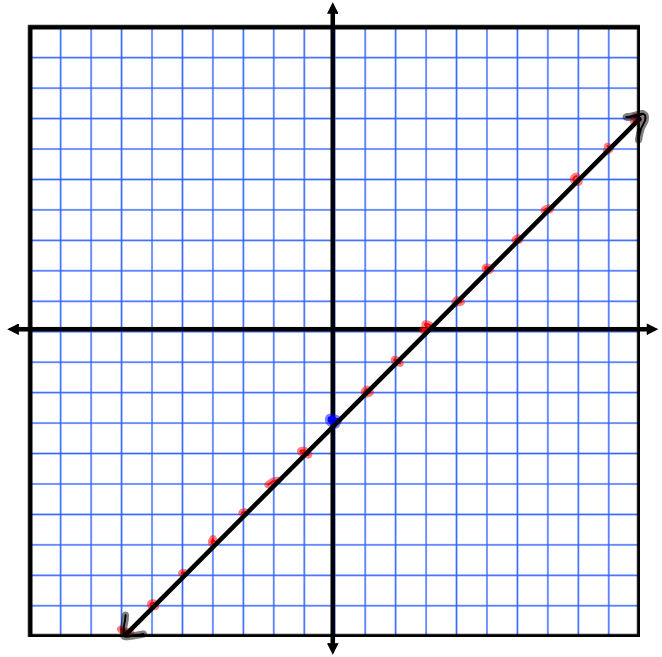$\hookrightarrow$ the biggest power is 2

Quadratic functions all graph into curved lines called parabolas.

Draw the graph of each linear function. (pg 386)

No powers, therefore linear.
Use $y = mx + b$.

1) $g \longrightarrow x : x - 3$ Rewrite properly.

$g(x) = 1x - 3$

$m = 1 = \frac{1}{1} \frac{rise}{run}$

$b = -3$
$(0, -3)$

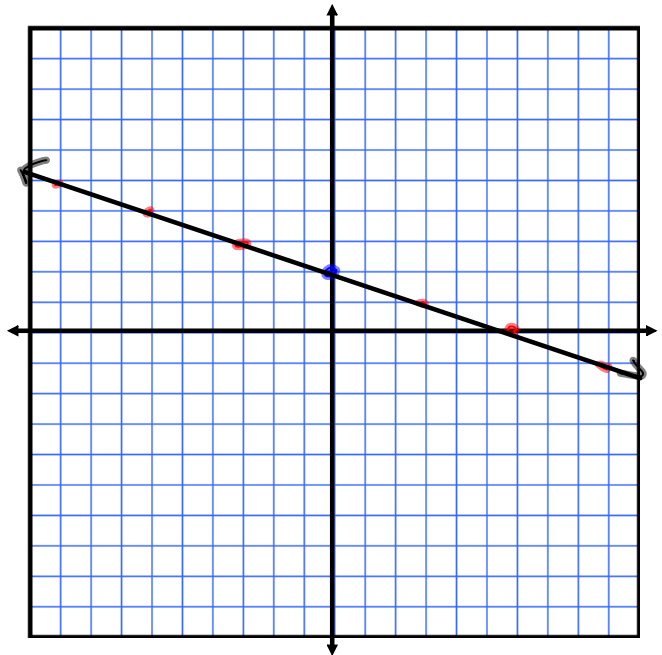
Draw the graph of each linear function.

No powers, therefore linear.
Use $y = mx + b$.

3) $q(x) = 2 - \frac{1}{3}x$

$m = -\frac{1}{3} \frac{rise}{run}$

$b = 2$
$(0, 2)$

Draw the graph of each quadratic function.

Quadratic (power of 2).
Plot points.

7) $f(x) = x^2 - 5$

m and b
don't work for quadratics,
graph into
parabolas

x	F(x)
0	-5
1	-4
2	-1
3	4
4	11
-1	4

$F(0) = (0)^2 - 5$
$F(1) = (1)^2 - 5$
$F(2) = (2)^2 - 5$
$F(3) = (3)^2 - 5$
$F(4) = (4)^2 - 5$
$F(-1) = (-1)^2 - 5$

finish with
symmetry

Once the outputs start to repeat,
use symmetry to finish plotting.
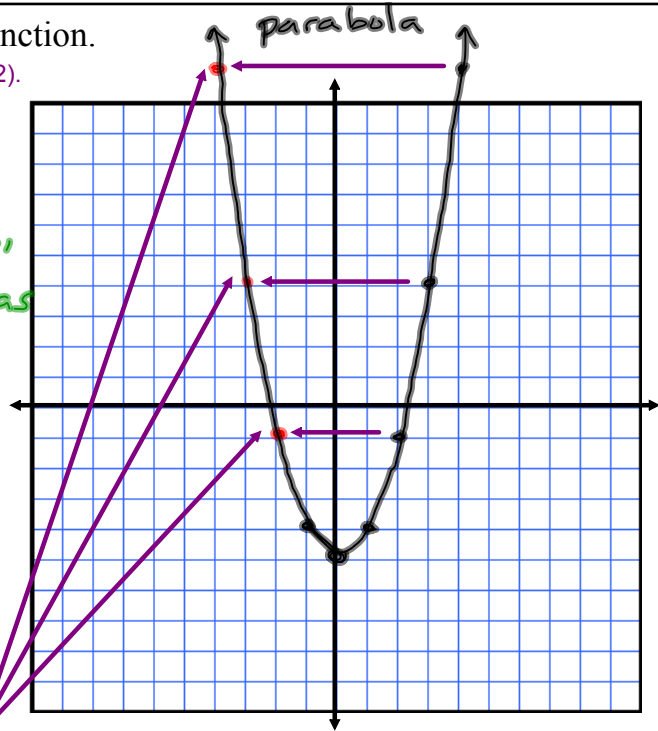
parabola
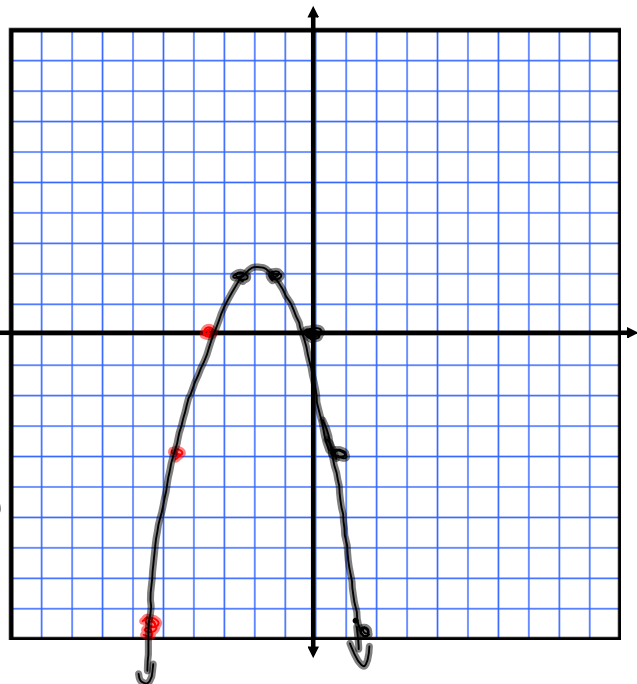

Draw the graph of each quadratic function.

Quadratic (power of 2).
Plot points.

13) $g(x) = -x^2 - 3x$

x	g(x)
0	0
1	-4
2	-10
-1	2
-2	2

$g(0) = -(0)^2 - 3(0)$
$g(1) = -(1)^2 - 3(1)$
$= -1 - 3 = -4$
$g(2) = -(2)^2 - 3(2)$
$= -4 - 6$
$g(-1) = -(-1)^2 - 3(-1)$
$= -1 + 3$
$g(-2) = -(-2)^2 - 3(-2)$
$= -4 + 6$

finish with
symmetry

PG 386

2-8 even
14
20
26
28 → change to $y = x^2 - 3x - 4$

8 graphs!

Don't use
-10