Practice: pp. 56-58 #1 – 7 1c 4b 6c

1. List the sequence of steps required to graph each function.

a) $f(x) = 3(x + 2)^2$

c) $f(x) = \frac{1}{3}x^2 - 3$

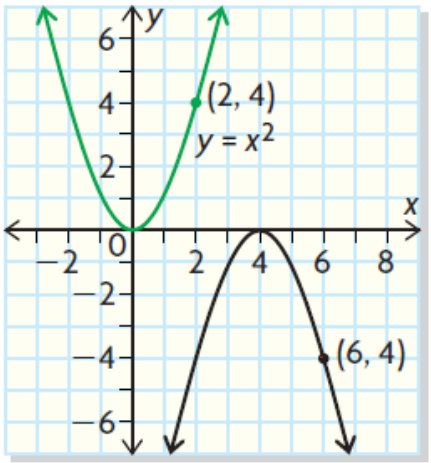
plot the vertex $(0, -3)$

use $a = \frac{1}{3}$ to change step pattern

$\therefore$ v.c. by a factor of $\frac{1}{3}$ (widen)

4. Transformations are applied to the graphs of $y = x^2$ to obtain the black parabolas. Describe the transformations that were applied. Write an equation for each black parabola.

b)



reflection in the x-axis

h.t. 4 units right

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

6. Consider a parabola P that is congruent to $y = x^2$ ($\therefore a = 1$), opens upward (+ve), and has vertex $(2, -4)$. Now find the equation of a new parabola that results if P is

a) stretched vertically by a factor of 5

b) compressed by a factor of $\frac{1}{2}$

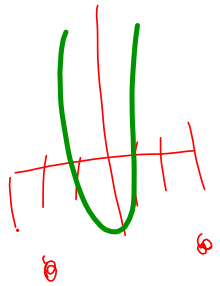
c) translated 2 units to the left

d) translated 3 units up

e) reflected in the x-axis and translated 2 units to the right and 4 units down

$P(x) = (x-2)^2 - 4$

$P'(x) = (x \quad)^2 - 4$



1.R Intro to Quadratic Functions Review

$f(x) = a(x-h)^2 + k$

Date: Sept. 24/19

1. Determine, without graphing, which type of relationship (linear, quadratic, neither) best models this table of values. Be sure to state a conclusion.

x	y
-1	6
0	7
1	2
2	-9
3	-26

1ST Diff

$7-6=1$

$2-7=-5$

$-9-2=-11$

$-26-(-9)$

$-26+9=-17$

2nd diff

$-5-1=-6$

$-11-(-5)=-6$

$-17-(-11)$

$=-17+11=-6$

∵ the 2nd differences are constant

∴ the table represents a quadratic relation

2. State the degree of each function and whether each is linear, or quadratic, or neither.

a) $f(x) = 5x^2 - 3$

Degree = 2

L (Q) N

b) $g(x) = 4 - 7x^1$

Degree = 1

(L) Q N

c) $y = (x-1)(3x^2-2)$

$= 3x^3 - 2x - 3x^2 + 2$

Degree = 3

L Q (N)

3. Evaluate the function $f(x) = 3x^2 - 2x - 5$ at the given values.

a) $f(4)$

$= 3(4)^2 - 2(4) - 5$

$= 3(16) - 8 - 5$

$= 48 - 8 - 5$

$= 35$

b) $f(-2)$

$= 3(-2)^2 - 2(-2) - 5$

$= 3(4) + 4 - 5$

$= 12 + 4 - 5$

$= 11$

c) $f(x+2)$

$(x+2)(x+2)$

$x^2 + 4x + 4$

$= 3(x+2)^2 - 2(x+2) - 5$

$= 3(x^2 + 4x + 4) - 2x - 4 - 5$

$= 3x^2 + 12x + 12 - 2x - 9$

$= 3x^2 + 10x + 3$

4. Given: $f(x) = -\frac{1}{2}(x+3)^2 + 9$
   a) Describe the transformations, using appropriate mathematical language.
   b) Graph the function.
   c) State the Domain and Range.

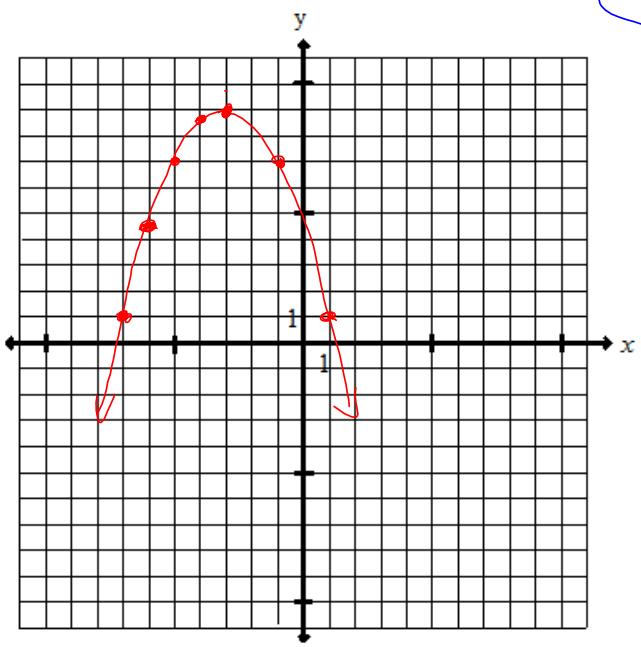
v.c. by a factor of $\frac{1}{2}$

vertex $(-3, 9)$

reflection in the x-axis

h.t 3 units to the left

v.t. 9 units up

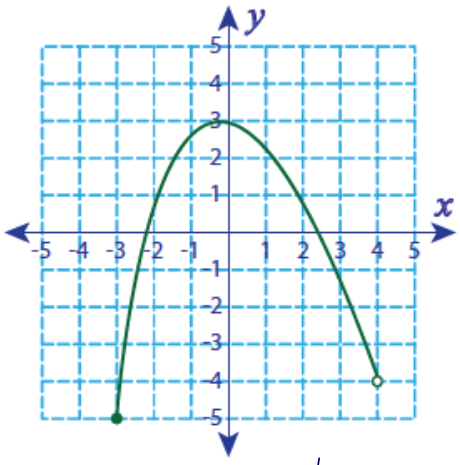


MF $a = -\frac{1}{2}$

1	~~$\frac{1}{2}$~~	
2	4	$\to -2$
~~3~~	~~9~~	
4	16	$\to -8$

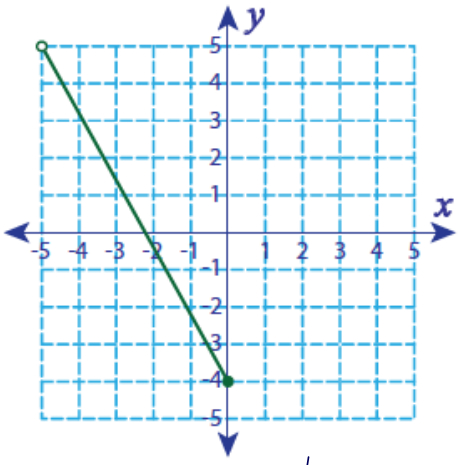
Domain $\{x \in \mathbb{R}\}$

Range $\{y \in \mathbb{R} \mid y \leq 9\}$



Domain : $\{x \in \mathbb{R} \mid -3 \leq x < 4\}$

Range : $\{y \in \mathbb{R} \mid -5 \leq y \leq 3\}$



Domain : $\{x \in \mathbb{R} \mid -5 < x \leq 0\}$

Range : $\{y \in \mathbb{R} \mid -4 \leq y < 5\}$

READ pp. 66-67

pp. 68–69 # 1 – 10

p. 70 # 1 – 4, 5abc, 6