SOLUTIONS => Practice Questions

1 a) $f(x) = -x^2+4x+1$ $A(0,1)$ $B(3,-4)$

* Remember $f(x) \Leftrightarrow y$.

=> $A(0,1)$ (x, y)

L.S	R.S.
y	$-x^2+4x+1$
$=1$	$=-(0)^2+4(0)+1$
	$=1$

Since L.S = R.S, point $A(0,1)$ satisfies the equation

=> $B(3,-4)$

L.S	R.S
y	$-x^2+4x+1$
$=-4$	$=-(3)^2+4(3)+1$
	$=-9+12+1$
	$=3+1$
	$=4$

Since L.S ≠ R.S, point $B(3,-4)$ does not satisfy the equation

b) $f(x) = -x^2+4$ $A(3,-6)$ $B(-2,0)$

=> A(3,-6)

x y

L.S: $y = -6$

R.S: $-x^2+4 = -(3)^2+4 = -9+4 = -5$

Since L.S ≠ R.S, point A(3,-6) does not satisfy the equation

=> B(-2,0)

x y

L.S: $y = 0$

R.S: $-x^2+4 = -(-2)^2+4 = -4+4 = 0$

Since L.S = R.S, point B(-2,0) satisfies the equation.

c) $f(x) = 3x^2 + 2x - 4$ A(2,12) B(5,81)

=> A(2,12)

L.S	R.S.
y	$3x^2+2x-4$
	$=3(2)^2+2(2)-4$
= 12	$=3(4)+4-4$
	$= 12+4-4$
	$= 16-4$
	$= 12$

Since L.S = R.S, point A(2,12) satisfies the equation.

=> B(5,81)

L.S	R.S
y	$3x^2+2x-4$
= 81	$=3(5)^2+2(5)-4$
	$=3(25)+10-4$
	$= 75+10-4$
	$= 85-4$
	$= 81$

Since L.S = R.S, point B(5,81) also satisfies the equation.

② $f(x) = -2x^2 + 4$

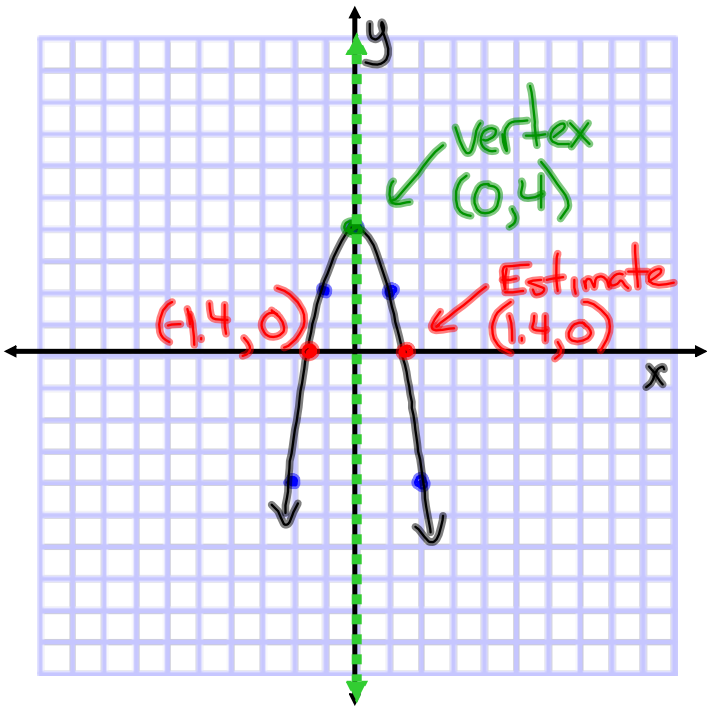
$y = -2x^2 + 4$

a)

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

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

$y = -2(-1)^2 + 4$



b) Domain: $\{x \in R\}$ arrows

Range: $\{y \leq 4, y \in R\}$

- Vertex: (0,4)

  Axis of Symetry: $x = 0$

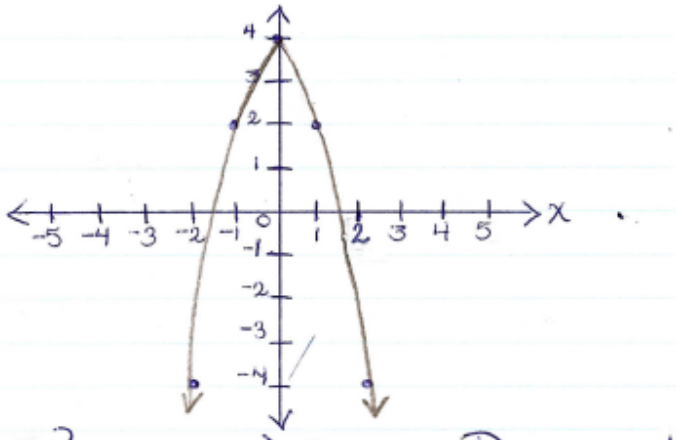
- Zeros: (-1.4,0) + (1.4,0) or $x = \pm 1.4$

  Maximum (0,4)

c) Opens Down

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

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



b) Domain: $\{x \mid x \in R\}$

Range: $\{y \mid y \leq 4, y \in R\}$

Vertex: $(0, 4)$

Zeros of the Function: $x = -1.4$ and $x = 1.4$

Maximum Value: $(0, 4)$ or $y = 4$

c) Opens Downward

Homework

① a) $f: x \to 3x^2$

$y = 3x^2$ (Quadratic)

b) $g: x \to 2x^3 - 5$

$y = 2x^3 - 5$ (Cubic)

④ Express in: $y = ax^2 + bx + c$

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

$y = 3(x-1)(x-1)$

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

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

$y = 3x^2 - 6x + 3$