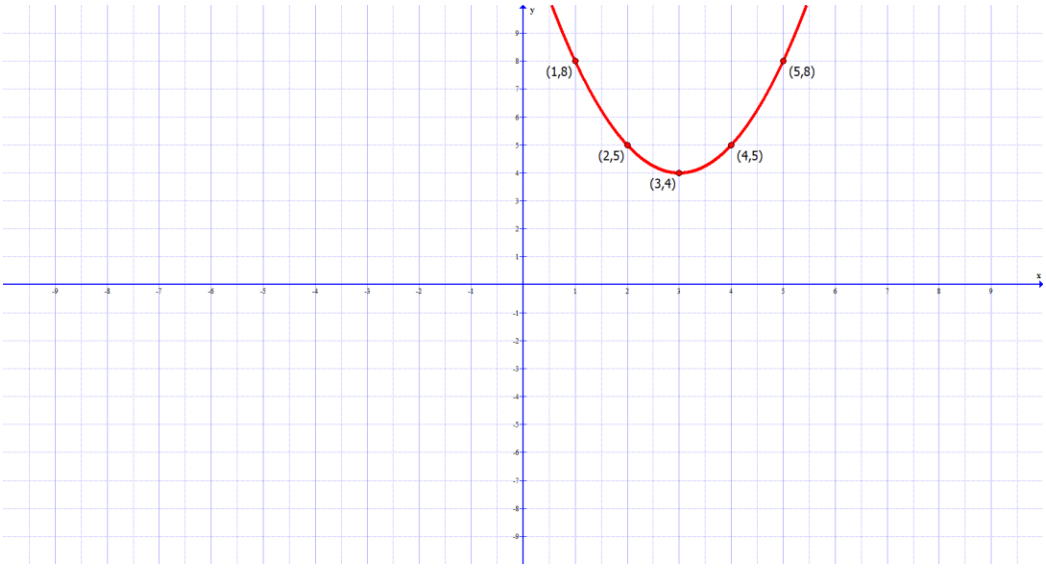
Section 4.3

1a) $f(x-3)+4 = (x-3)^2 + 4$

The graph has the same shape as $f(x) = x^2$, except it is shifted right 3 units and up 4 units.

1b)

x	y
5	8
4	5
3	4
2	5
1	8



1c) Domain $(-\infty, \infty)$ Range $[4, \infty)$

1d) The graph is increasing $(3, \infty)$ and decreasing from $(-\infty, 3)$

1e) The graph does not have a high point, so it has no local maximum

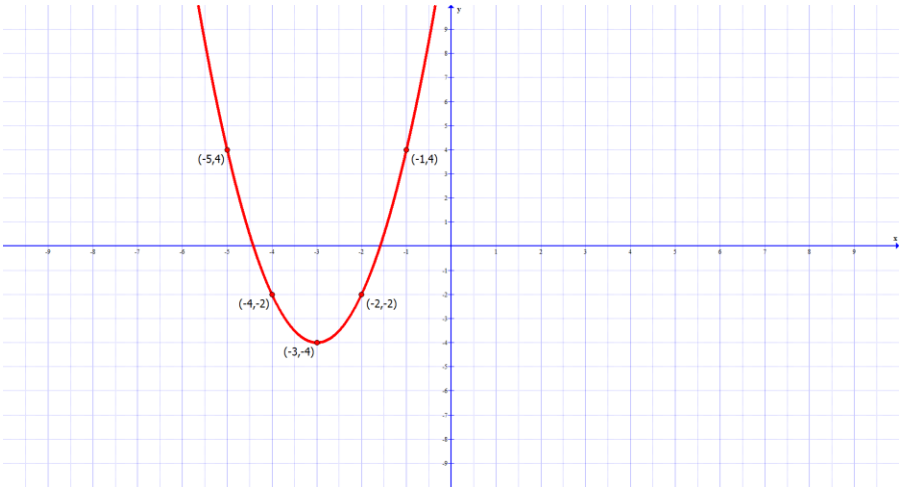
1f) local minimum point (3, 4) local minimum value y = 4 which occurs when x = 3

3a) $2f(x+3) - 4 = 2(x+3)^2 - 4$

The graph has the same shape as $f(x) = x^2$, except it is shifted left 3 units and down 4 units and it is narrower (stretched).

3b)

x	y
-1	4
-2	-2
-3	-4
-4	-2
-5	4



3c) Domain $(-\infty, \infty)$ Range $[-4, \infty)$ (see me for help if you need some finding the domain and range)

3d) The graph is increasing $(-3, \infty)$ and decreasing from $(-\infty, -3)$

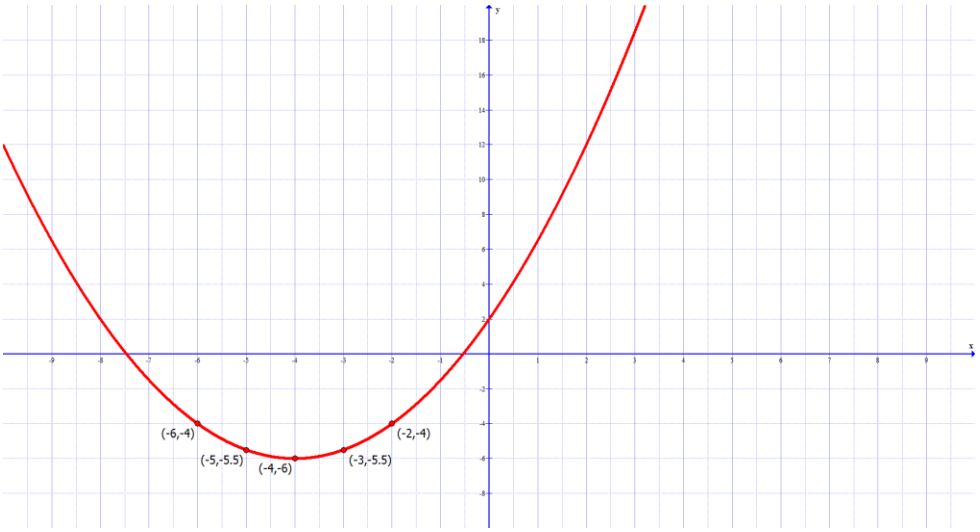
3e) The graph does not have a high point, so it has no local maximum

3f) local minimum point (-3, -4) local minimum value y = -4 which occurs when x = -3

5a) $\frac{1}{2}f(x+4)-6=\frac{1}{2}(x+4)^2-6$

The graph has the same shape as f(x) = x^2, except it is shifted left 4 units and down 6 units and the graph is wider (compressed) than f(x) = x^2.

x	y
-2	-4
-3	-5.5
-4	-6
-5	-5.5
-6	-4



5c) Domain $(-\infty,\infty)$ Range $[-6,\infty)$ (see me for help if you need some finding the domain and range)

5d) The graph is increasing $(-4,\infty)$ and decreasing from $(-\infty,-4)$

5e) The graph does not have a high point, so it has no local maximum

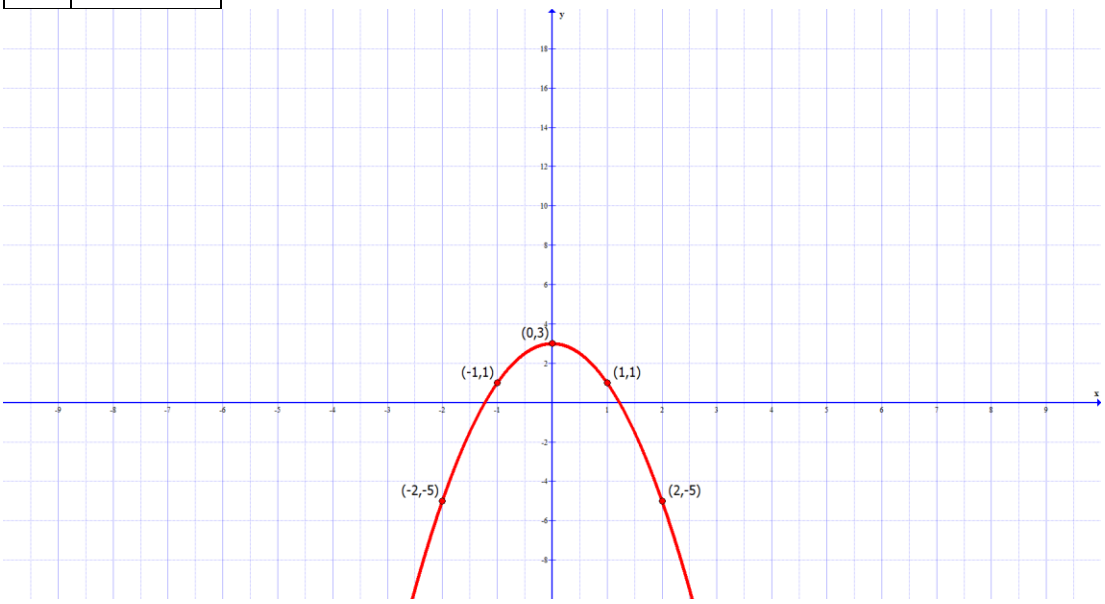
5f) local minimum point (3, 4) local minimum value y = -6 which occurs when x = -4

7a) : $-2f(x) + 3 = -2x^2 + 3$

The graph has the same shape as $f(x) = x^2$ except it is moved up 3 and reflected over the x-axis, and it is narrower (or stretched)

7b)

x	y
2	-5
1	1
0	3
-1	1
-2	-5



7c) Domain $(-\infty, \infty)$ Range $(-\infty, 3]$ (see me for help if you need some finding the domain and range)

7d) The graph is increasing from $(-\infty, 0)$ and decreasing from $(0, \infty)$

7e) The local maximum point (0,3) local maximum value y = 3 which occurs when x = 0

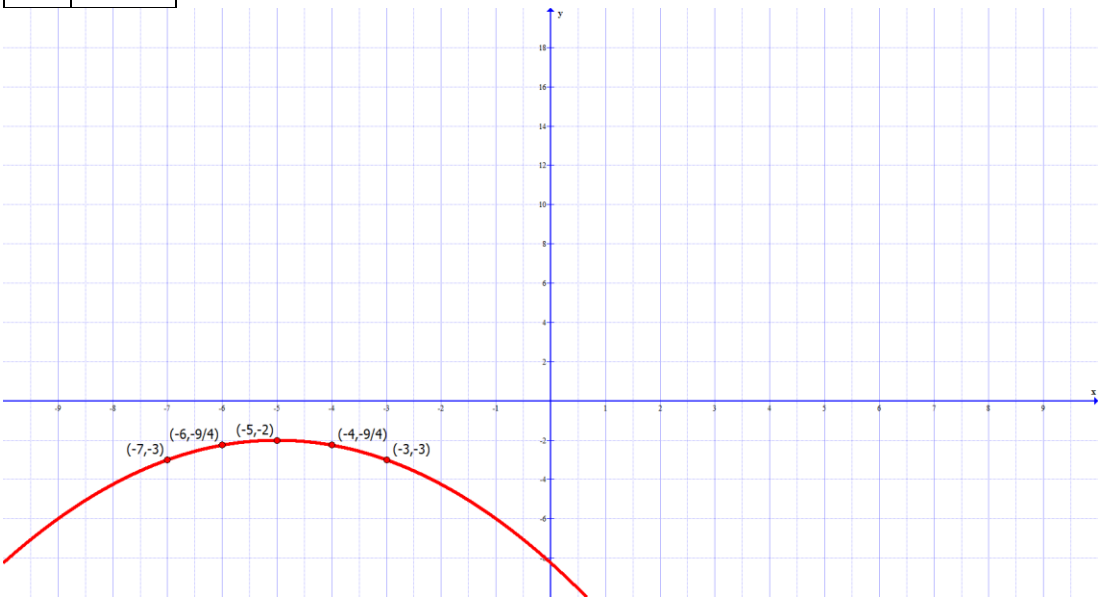
7f) There is no local minimum or local minimum value.

9a) $-\frac{1}{4}f(x+5)-2 = -\frac{1}{4}(x+5)^2-2$

The graph is the same as g(x) = x^2, except moved left 5, down 2 and reflected over the x-axis. The graph is wider, or compressed

9b)

x	y
-7	-3
-6	-2.25
-5	-2
-4	-2.25
-3	-3



9c) Domain $(-\infty, \infty)$ Range $(-\infty, -2]$ (see me for help if you need some finding the domain and range)

9d) The graph is increasing from $(-\infty, -5)$ and decreasing from $(-5, \infty)$

9e) The local maximum point (-5,-2) local maximum value y = -2 which occurs when x = -5

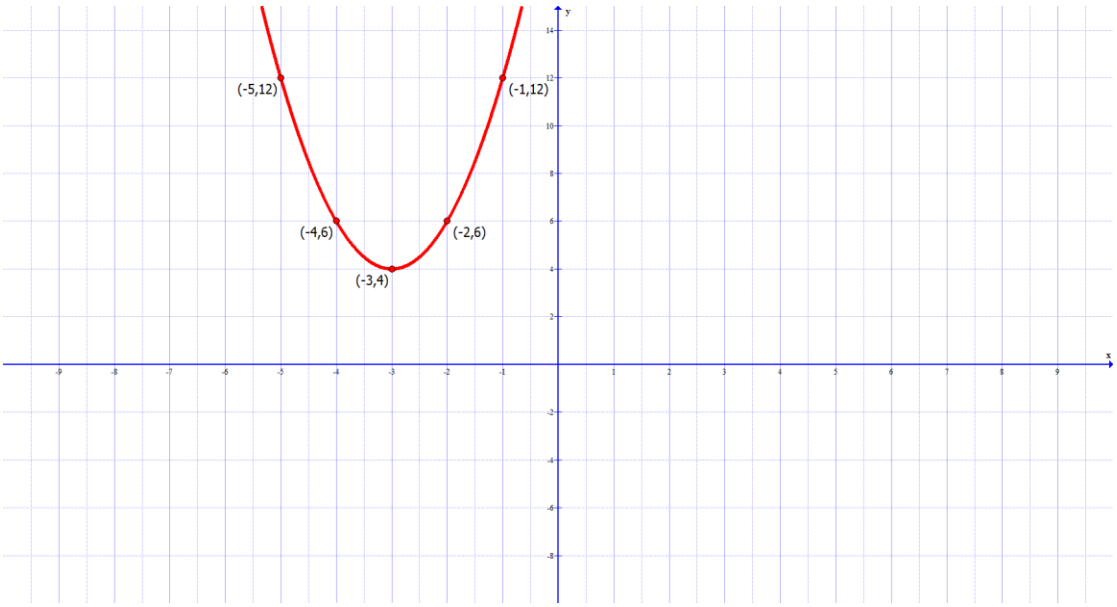
9f) There is no local minimum or local minimum value.

11a) $2f(x+3)+2 = 2(x+3)^2+4$

The graph has the same shape as $g(x) = x^2$, except it is shifted left 3 units and up 4 units and is narrower (stretched).

11b)

x	y
-1	12
-2	6
-3	4
-4	6
-5	-12



11c) Domain $(-\infty, \infty)$ Range $[4, \infty)$ (see me for help if you need some finding the domain and range)

11d) The graph is increasing $(-3, \infty)$ and decreasing from $(-\infty, -3)$

11e) The graph does not have a high point, so it has no local maximum point, nor value

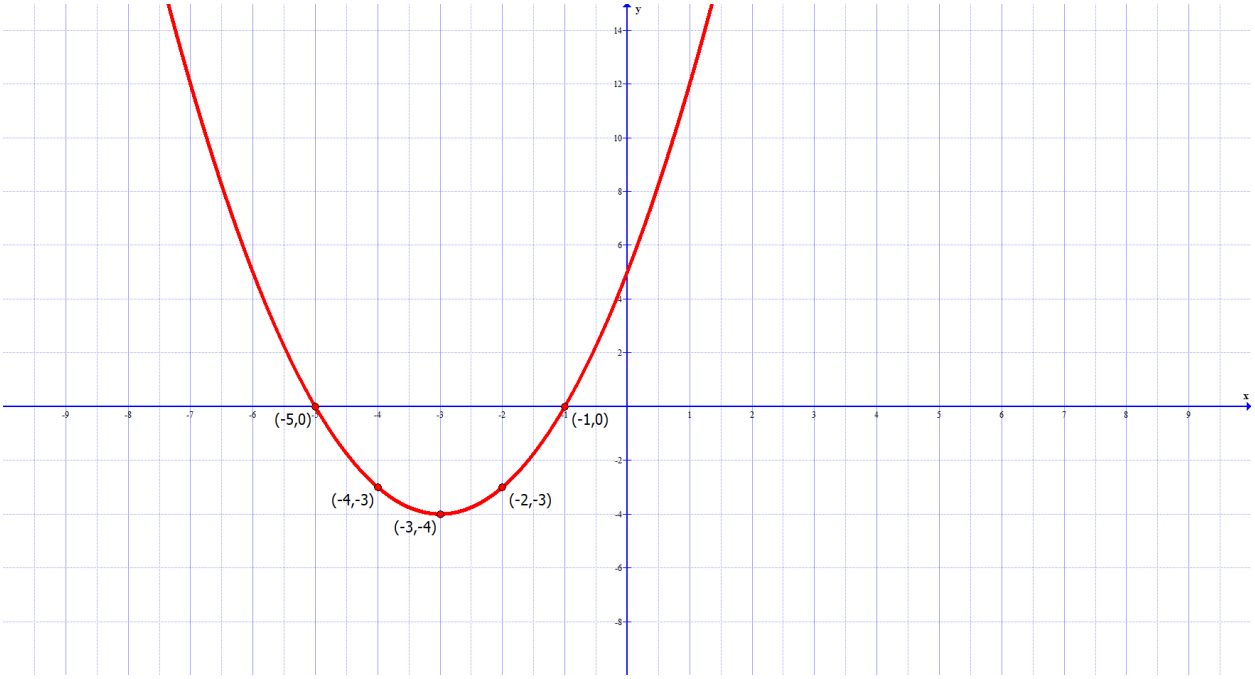
11f) local minimum point (-3, 4) local minimum value y = 4 which occurs when x = -3

13a) $f(x) = (x+3)^2 - 4$

13b) shifts left 3 and down4

13c) table from calculator

x	-5	-4	-3	-2	-1
y	0	-3	-4	-3	0



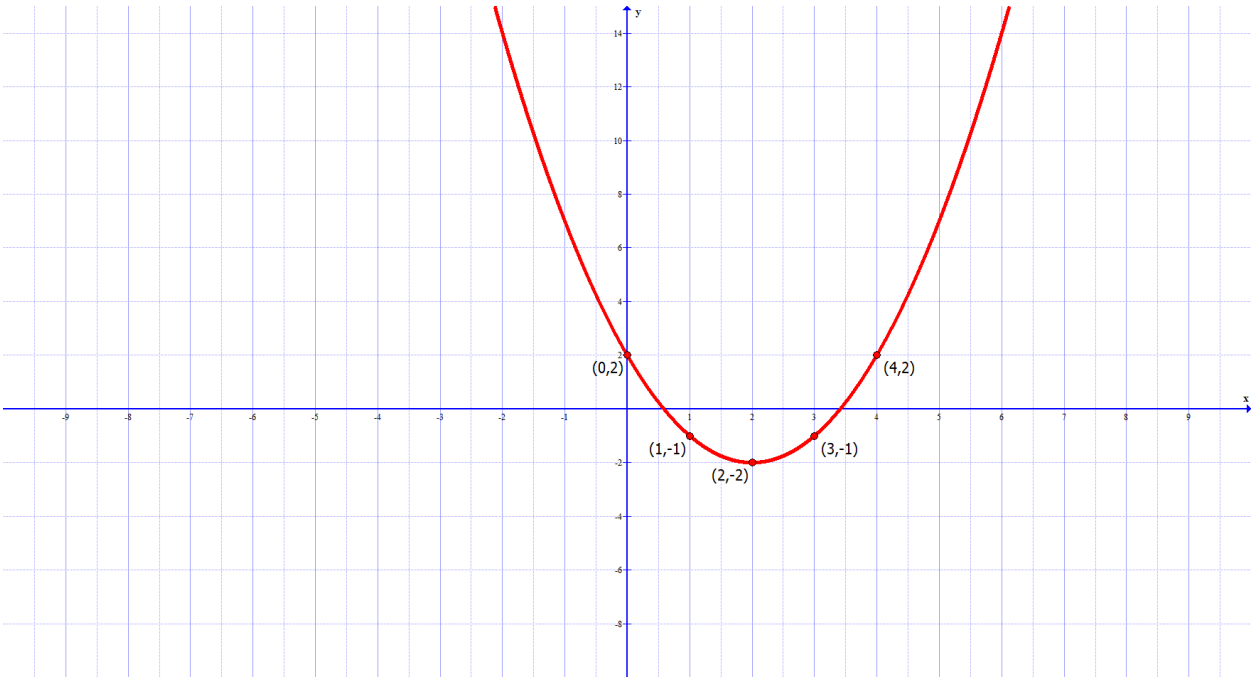
15a) $k(x) = (x-2)^2 - 2$

15b) right 2, down 2

15c)

table from calculator

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

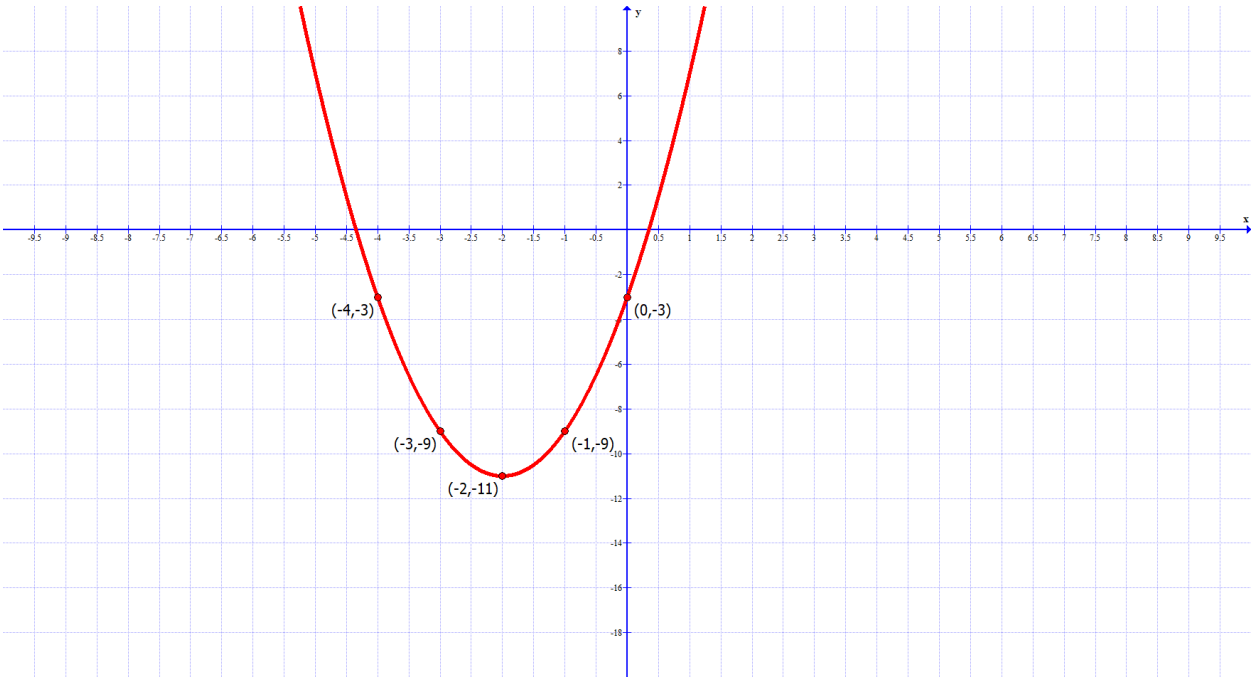


17a) $f(x) = 2(x+2)^2 - 11$

17b) stretched, left 2 down 11

17c) table from calculator

x	-4	-3	-2	-1	0
y	-3	-9	-11	-9	-3



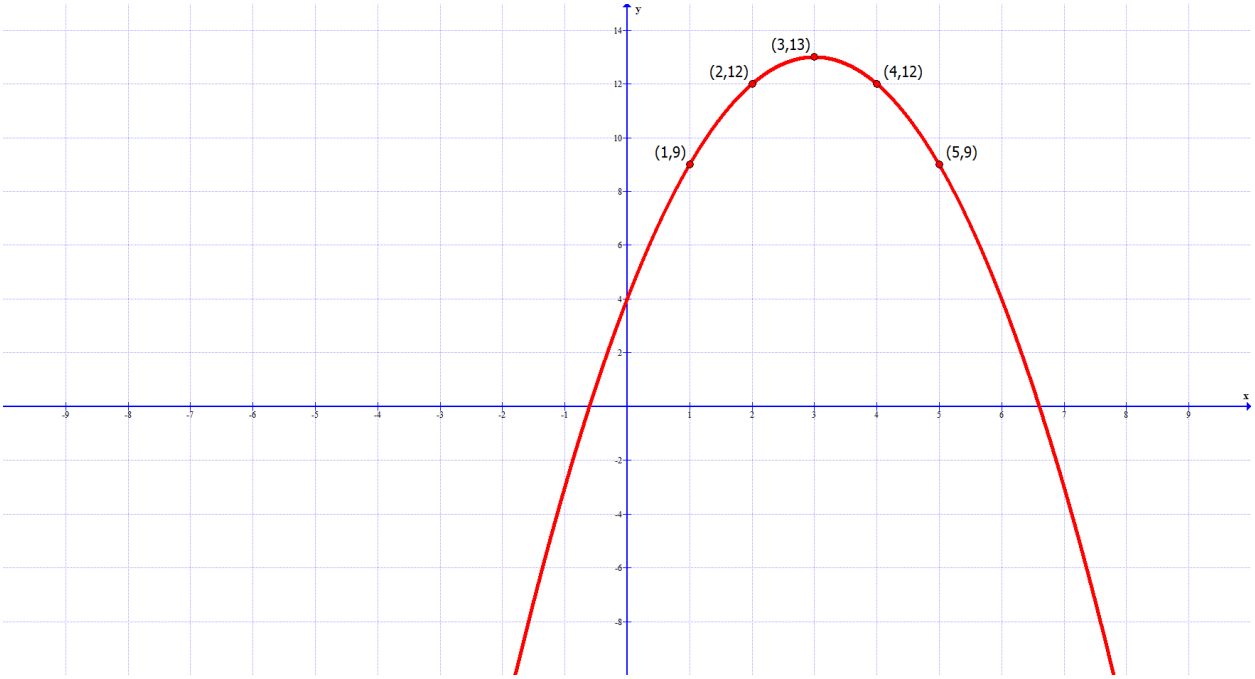
19a) $f(x) = -(x-3)^2 + 13$

19b) reflected over x-axis, right 3 up 13

19c)

table from calculator

x	1	2	3	4	5
y	9	12	13	12	9



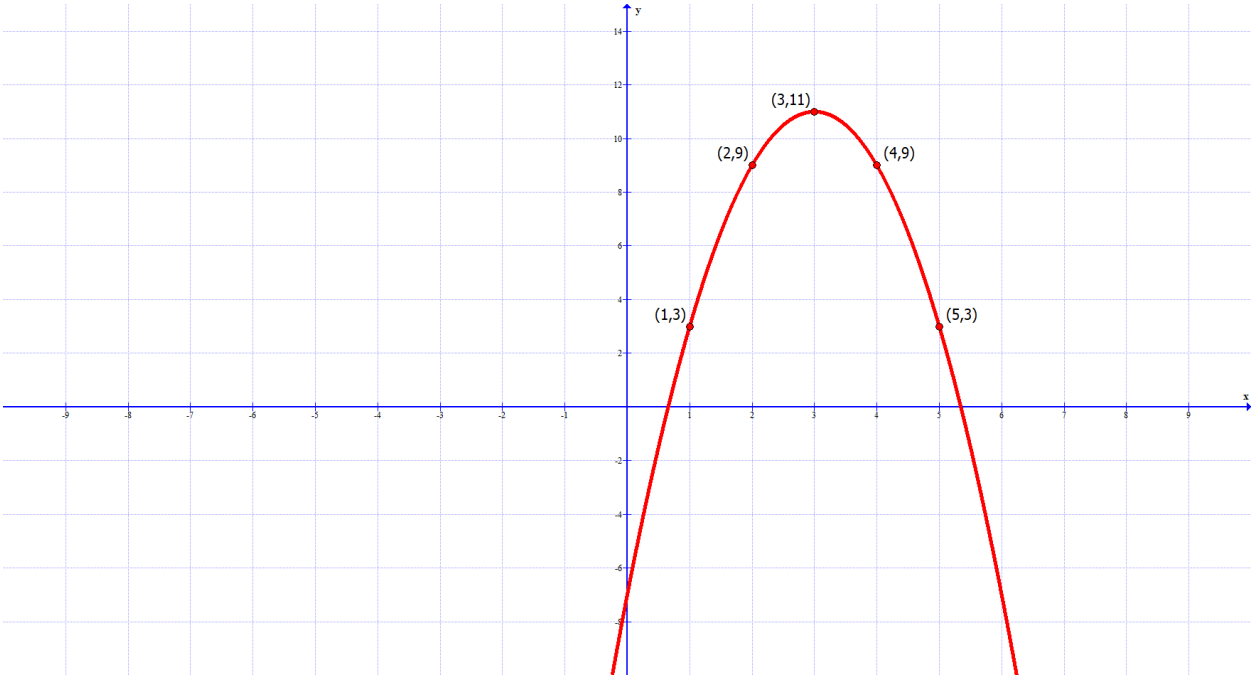
21a) $k(x) = -2(x-3)^2 + 11$

21b) reflect x-axis, stretched, right 3, up 11

21c)

table from calculator

x	1	2	3	4	5
y	3	9	11	9	3



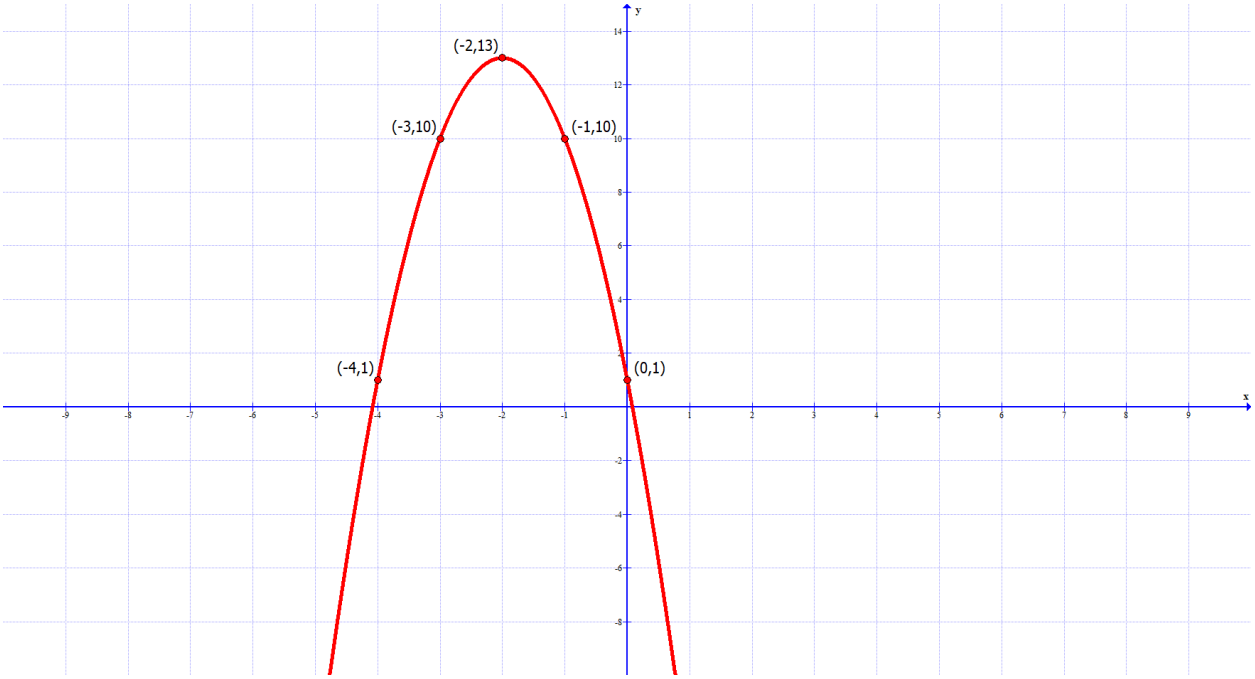
23a) $f(x) = -3(x+2)^2 + 13$

23b) reflected x-axis, stretched, left 2 up 13

23c)

table from calculator

x	-4	-3	-2	-1	0
y	1	10	13	10	1



25) $f(x) = 2(x-1)^2 - 4$ 27) $f(x) = -3(x+1)^2 + 5$ 29) $f(x) = \frac{1}{2}(x+2)^2 + 6$

31) $f(x) = -\frac{1}{4}(x+2)^2 + 3$