Mathematics 11C

4.4 – $y=a(x-h)^2+k$

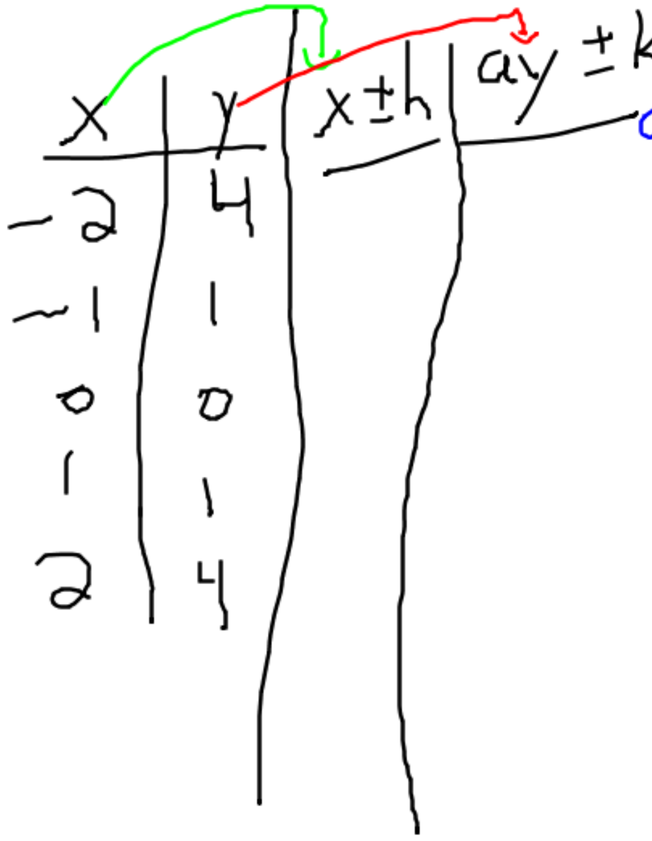
Mr. D. Hagen

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

Vertex Form

↳ (h, k)

Base quadratic $y = x^2$



a = vertical stretch/compression.

y multiply

h = horizontal shift

x add/subtract

k = vertical shift

y add/subtract

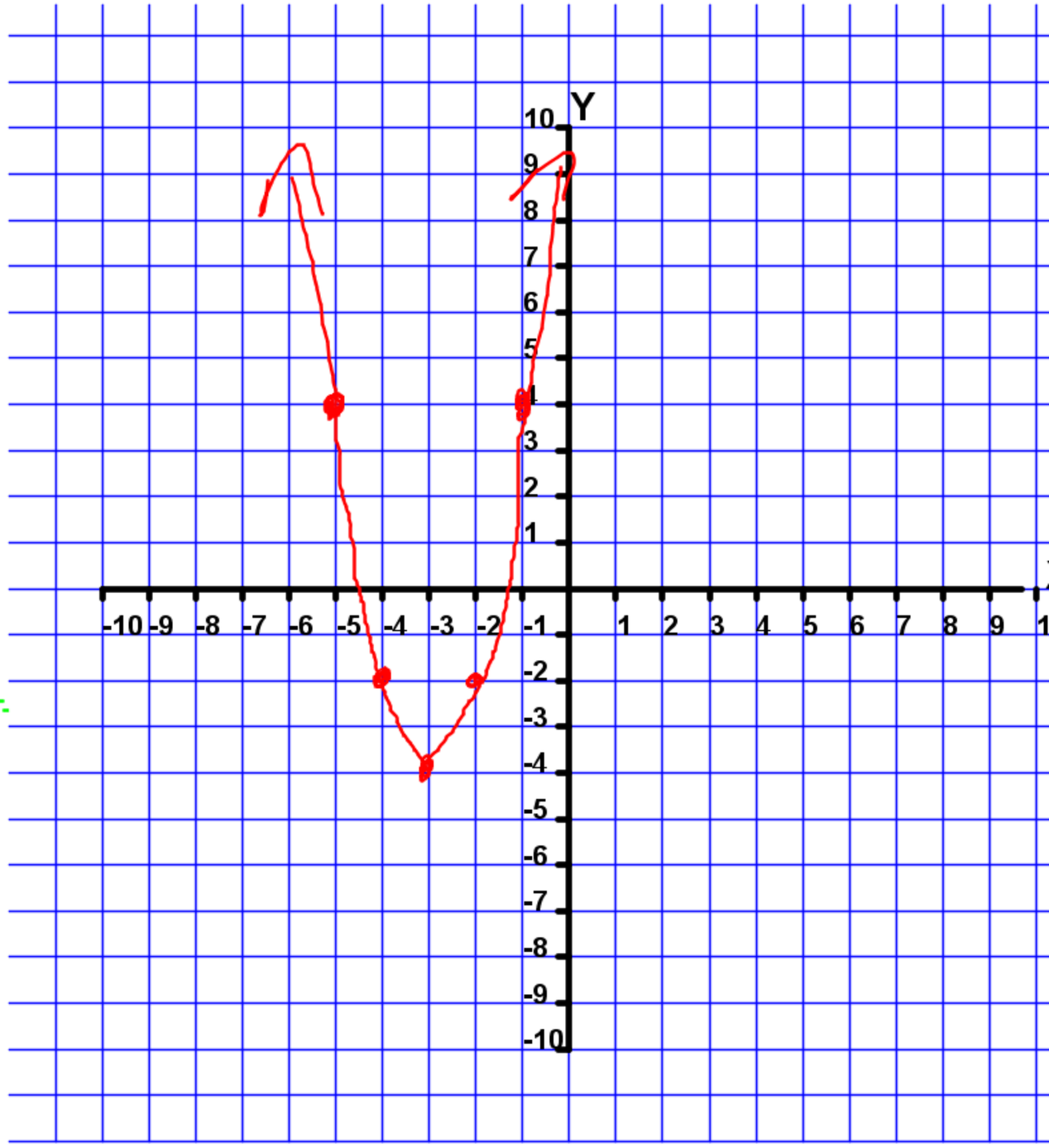
Graph:

1. $y = 2(x+3)^2 - 4$

a = 2, h = −3, k = −4

x	y
−2	4
−1	1
0	0
1	1
2	4

x − 3	2y − 4
−5	4
−4	−2
−3	−4 ← ver.
−2	−2
−1	4

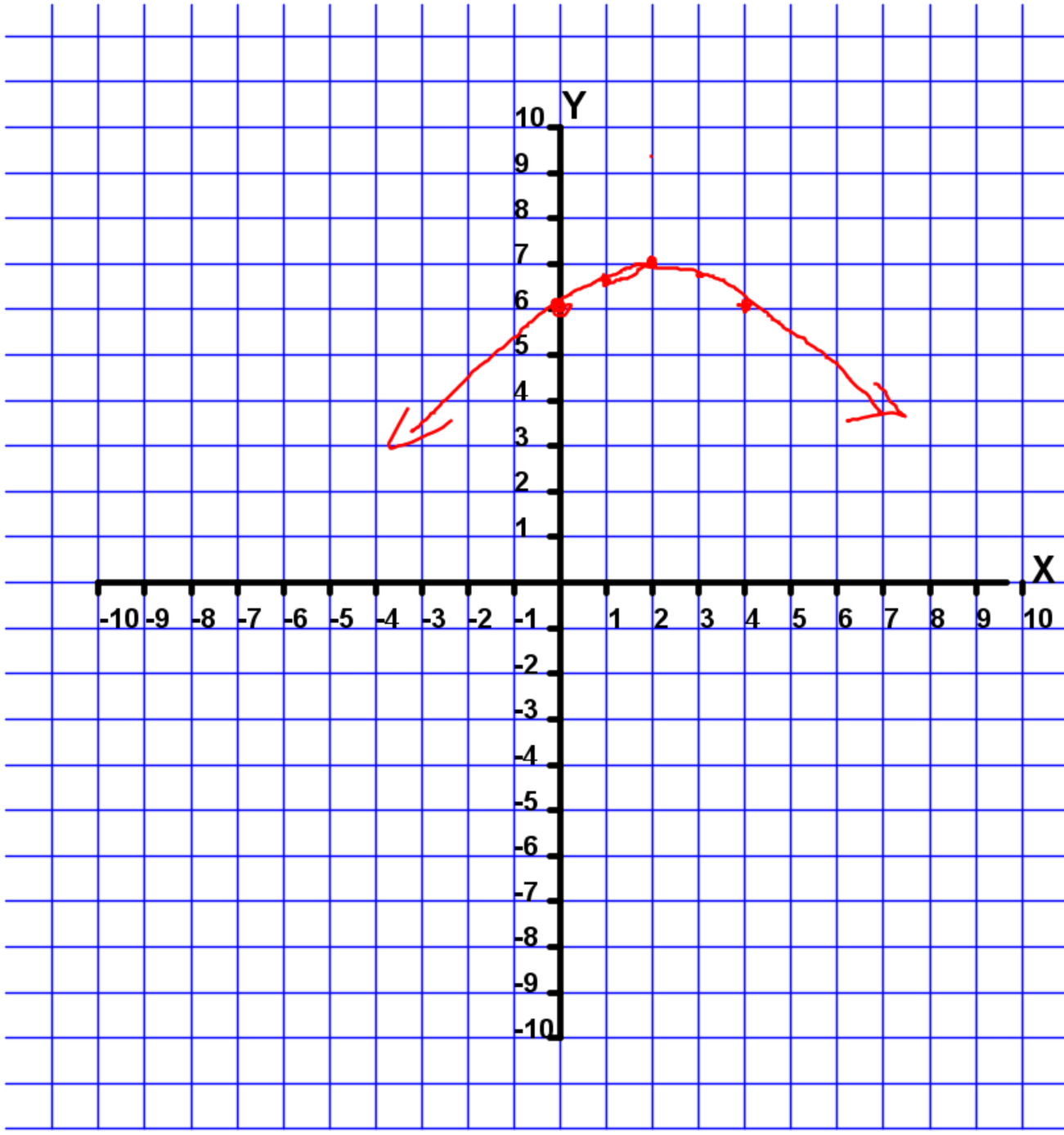


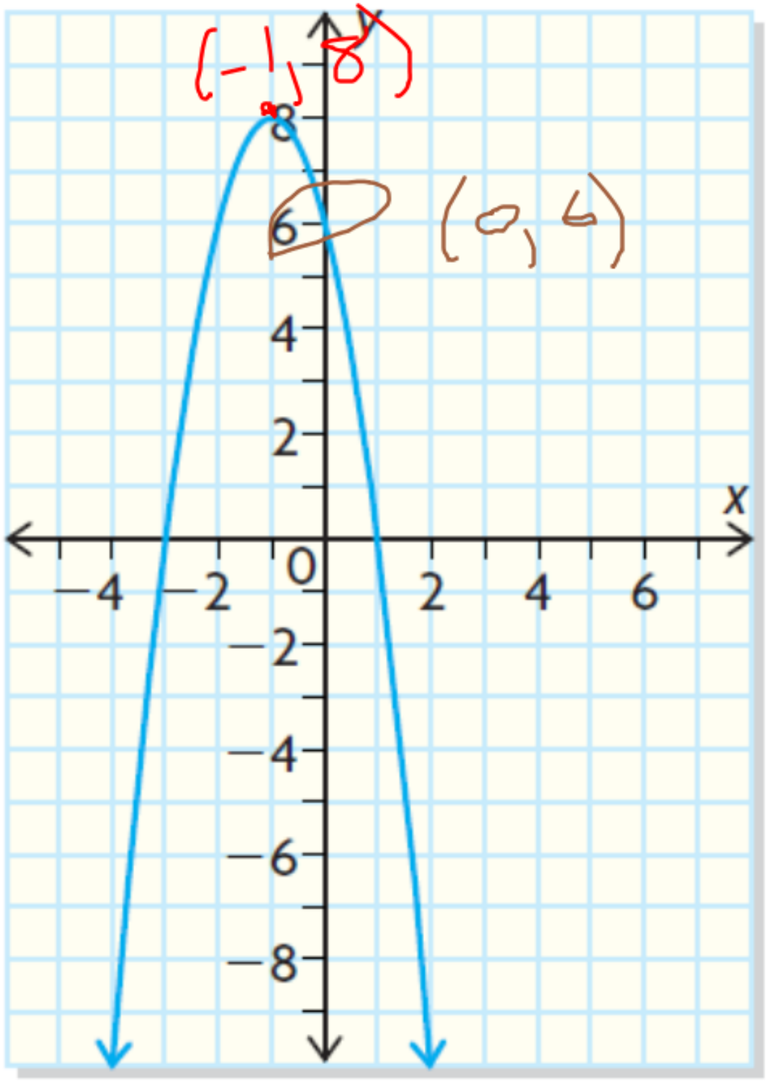
2. $y = -\frac{1}{4}(x-2)^2 + 7$

a h k

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

$x+2$	$-\frac{1}{4}y+7$
0	6
1	6.75
2	7
3	6.75
4	6



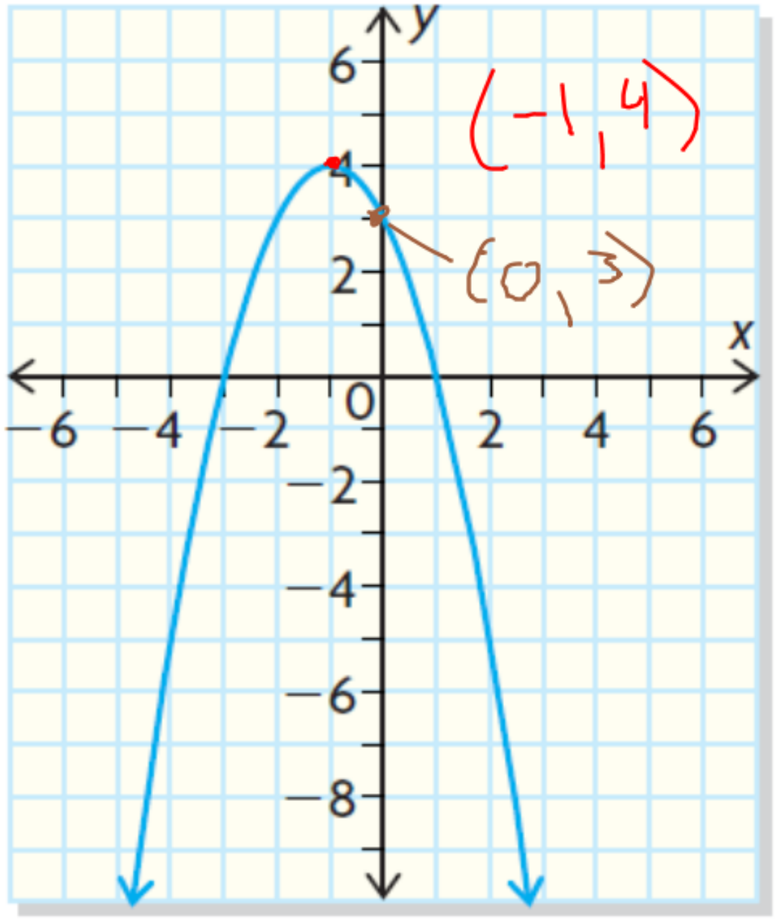


$$y = a(x-h)^2 + k$$

$$6 = a(0+1)^2 + 8 \quad (-8 \text{ from } -8)$$

$$-2 = a(1)$$

$$y = -2(x+1)^2 + 8$$



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

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

$$-1 = a$$

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