p. 210 #24 $y = (x-2)^2 + 5$

26 $y = -\frac{1}{2}(x+4)^2 + 2$

30 reflect x-axis, stretch factor 2, left 1, up 1

32 reflect x-axis, left 4, up 5

34 shrink factor $\frac{1}{5}$ right 12, down 3

38 $y = -\frac{1}{2}(x+3)^2 + 6$

40 $y = 8(x - \frac{1}{4})^2 - \frac{3}{2}$

#40 vertex $(\frac{1}{4}, -\frac{3}{2})$ (h, k)

point $(1, 3)$ (x_0, y_0)

general vertex form

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

$3 = a(1 - \frac{1}{4})^2 + (-\frac{3}{2})$

$3 = a(\frac{3}{4})^2 - \frac{3}{2}$

$3 = a(\frac{9}{16}) - \frac{3}{2}$

$\frac{6}{2} + \frac{3}{2} = \frac{9}{16}a$

$\frac{9}{2} = \frac{9}{16}a$

$\frac{16}{9} \cdot \frac{9}{2} = a$

$8 = a$

particular vertex form

$y = 8(x - \frac{1}{4})^2 - \frac{3}{2}$

topic: standard form of quadratic function

same as vertex form – stretch/shrink; if negative, reflect x-axis

$$y = ax^2 + bx + c$$

x-value of vertex (h):

y-intercept

$$h = -\frac{b}{2a}$$

k is output, y, when x=h

Example: p. 215 # 8
sketch the graph.
ID vertex, axis of symm, min/max, range.

particular → $y = 3x^2 - 4x - 2$

general → $y = ax^2 + bx + c$

$k = ah^2 + bh + c$

$a = 3 \quad b = -4 \quad c = -2$

i) find vertex

$h = -\frac{b}{2a} = \frac{-(-4)}{2 \cdot 3} = \frac{4}{6} = \frac{2}{3}$

$k = 3\left(\frac{2}{3}\right)^2 - 4\left(\frac{2}{3}\right) - 2$

$= 3\left(\frac{4}{9}\right) - \frac{8}{3} - 2$

$= \frac{4}{3} - \frac{8}{3} - \frac{6}{3}$

$k = -\frac{10}{3}$

vertex: $\left(\frac{2}{3}, -\frac{10}{3}\right)$

axis symm: $x = \frac{2}{3}$

min: $-\frac{10}{3}$

Range: $y \geq -\frac{10}{3}$

sketch of # 8