

selected evens p. 215

#6 vertex $(-1, 0)$

axis $x = -1$

min 0

range $y \geq 0$

#8 vertex $(\frac{2}{3}, -3\frac{1}{3})$

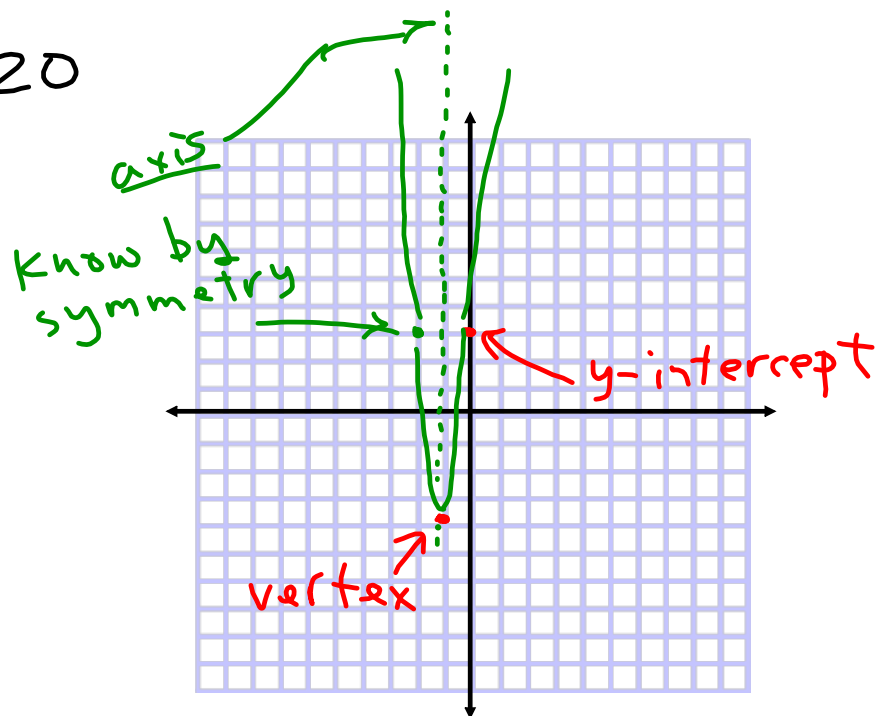
axis $x = \frac{2}{3}$

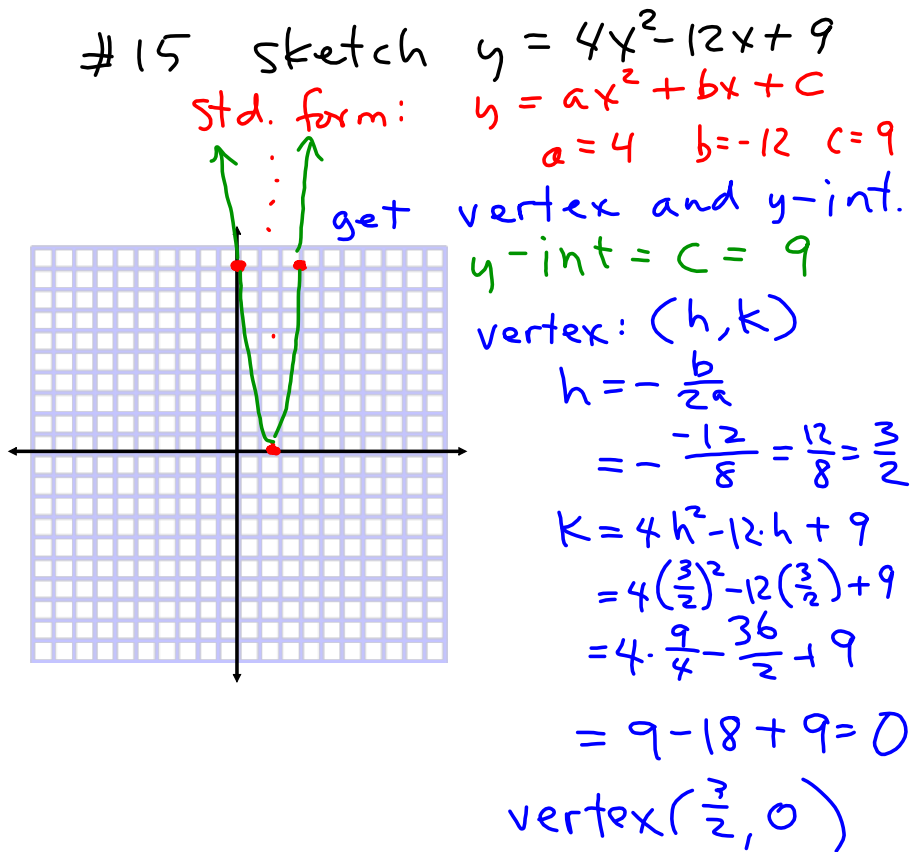
min $-3\frac{1}{3}$

range $y \geq -3\frac{1}{3}$

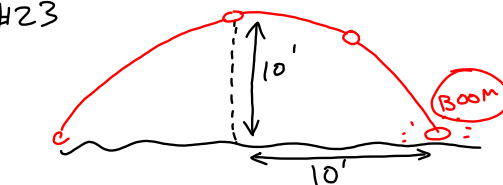
$$\left[-3\frac{1}{3} = -\frac{10}{3} \right]$$

#20





#23



vertex $(0, 10)$
 point $(10, 0)$

vertex form:

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

$$0 = a(10-0)^2 + 10$$

$$0 = a \cdot 100 + 10$$

$$-10 = 100 \cdot a$$

$$-\frac{10}{100} = a = -\frac{1}{10}$$

$$y = -\frac{1}{10}(x-0)^2 + 10$$

$$y = -\frac{1}{10}x^2 + 10$$

both vertex and
 standard form

going from standard to vertex:

$$y = 2x^2 + 10x + 7$$

$$h = -\frac{b}{2a} = -\frac{10}{4} = -\frac{5}{2}$$

$$k = 2\left(-\frac{5}{2}\right)^2 + 10\left(-\frac{5}{2}\right) + 7$$

$$= 2 \cdot \frac{25}{4} - \frac{50}{2} + 7$$

$$= \frac{25}{2} - \frac{50}{2} + \frac{14}{2}$$

$$= -\frac{11}{2}$$

$$\text{vertex: } \left(-\frac{5}{2}, -\frac{11}{2}\right)$$

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

$$y = 2\left(x + \frac{5}{2}\right)^2 - \frac{11}{2}$$

vertex to standard:

① expand $(x-h)^2 = x^2 - 2hx + h^2$

$$(x-h)(x-h) = x^2 - \underbrace{hx - hx}_{-2hx} + h^2$$

② combine like terms

Example: $y = 3(x+2)^2 - 5$
put in standard form

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

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

$$y = 3x^2 + 12x + 12 - 5$$

$$y = 3x^2 + 12x + 7$$

standard form