

Topic: vertex form.

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

stretch or shrink factor
 $|a| > 1$ stretch
 $|a| < 1$ shrink

x-value of vertex

y-value of vertex

if you see this form, you can read the vertex

Example: $y = -3(x+5)^2 + 7$, stretch opening down
 vertex $(-5, 7)$
 h ' k

pp. 209-210 even s

18. vertex $(3.2, 0)$

axis $x = 3.2$

min 0

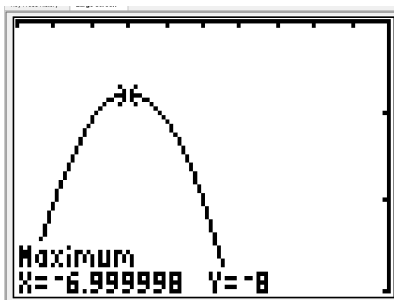
D \mathbb{R}

range $y \geq 0$

12. right 2

14. left 3

16. left 5



#20 vertex $(4, -25)$

axis $x = 4$

max -25

dom. \mathbb{R}

range $y \leq -25$

#22 $x = -7$ axis.

#22 (graph)

$$y = -3(x+7)^2 - 8$$

reflected (opens downward) \leftarrow
 stretch factor of 3 \leftarrow
 $h = -7$ \leftarrow
 $k = -8$ \leftarrow
 vertex (-)

Range

example: vertex: $(2, -5)$ min case

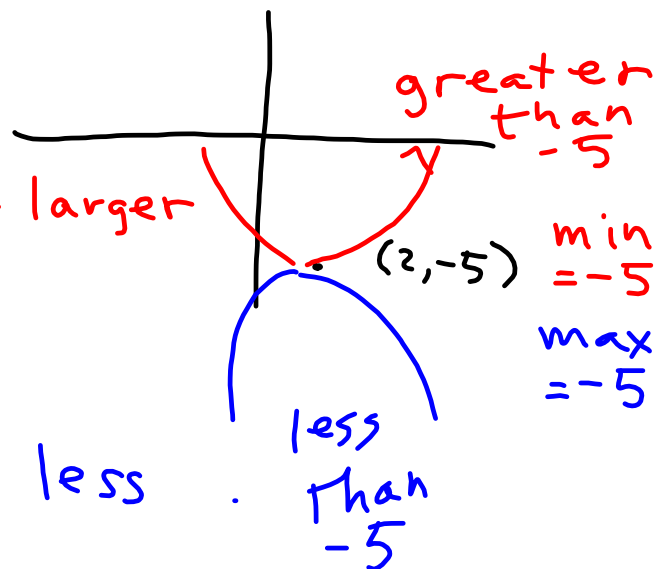
y must be -5 or larger

$$y \geq -5$$

max case

y must be -5 or less

$$y \leq -5$$



Topic: making vertex form.
text book p. 208 - dolphin
start with:

$$\text{max: } x=3, y=7$$

$$\text{i.e. } (3, 7)$$

$$h=3 \quad k=7$$

$$\text{another pt } x=9, y=4$$

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

$$4 = a(9-3)^2 + 7$$

$$4 = a(6)^2 + 7$$

$$4 = 36a + 7$$

$$-3 = 36a$$

$$a = -\frac{3}{36} = -\frac{1}{12}$$

$$y = -\frac{1}{12}(x-3)^2 + 7$$

↑
model of
dolphin's motion

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

↑
reflect
over
x-axis

↑
stretch
factor
of
2

↑
translate
right by
1 unit