Name _____ Date _____

CHAPTER 9

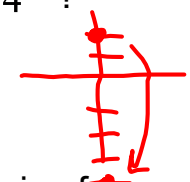
Quiz 9.1 to 9.3 Review

$y=ax^2+bx+c$ $x=\frac{-b}{2a}$

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

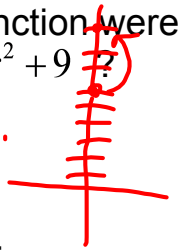
1. How would the graph of the function $y=x^2+2$ be affected if the function were changed to $y=x^2-4$?

moving down 6 units



2. How would the graph of the function $y=x^2+6$ be affected if the function were changed to $y=x^2+9$?

moving up 3.



3. Find the vertex & axis of symmetry of the functions:

a) $y=-4x^2+16x-1$

$a=-4$ $b=16$ $c=-1$

$x=\frac{-b}{2a}=\frac{-16}{-8}=2$

$x=2$ axis

$(2, 15)$

$y=-4(2)^2+16(2)-1$

$y=-16+32-1=15$

b) $g(x)=4x^2+16x-3$

$a=4$ $b=16$ $c=-3$

$x=\frac{-16}{8}=-2$ $x=-2$

$(-2, -19)$

$g(-2)=4(-2)^2+16(-2)-3$

$=16-32-3=-19$

4. What is the vertex & axis of symmetry of the functions:

a) $f(x)=(x-7)^2-8$

$V=(7, -8)$

$x=7$

b) $m(x)=-3(x+2)^2+7$

$V=(-2, 7)$

$x=-2$

5. Convert both equations in #4 to standard form.

a) $f(x)=(x-7)^2-8$

-7×2

$x^2-14x+49-8$

$f(x)=x^2-14x+41$

$(x-7)(x-7)-8$

$x^2-7x-7x+49-8$

$f(x)=x^2-14x+41$

b) $m(x)=-3(x+2)^2+7$

2×2

$-3(x^2+4x+4)+7$

$-3x^2-12x-12+7$

$m(x)=-3x^2-12x-5$

$m(x)=-3(x+2)(x+2)+7$

$-3(x^2+2x+2x+4)+7$

$-3(x^2+4x+4)+7$

$-3x^2-12x-12+7$

$-3x^2-12x-5$

For the given equations, graph the function using a table of at least three values, then answer the accompanying questions.

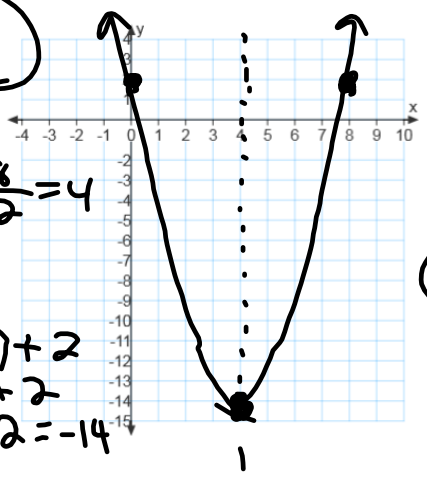
6. $p(x) = x^2 - 8x + 2$

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

x	y
4	-14
0	2
8	2

$x = \frac{8}{2} = 4$

$4^2 - 8(4) + 2$
$16 - 32 + 2$
$-16 + 2 = -14$



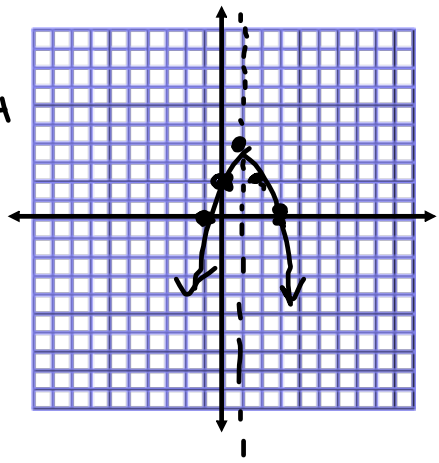
Opens: up
Axis of Symmetry: $x = 4$
Vertex: $(4, -14)$
Y-intercept: $(0, 2)$
Min or Max: -14
Domain: $\mathbb{R}$
Range: $y \geq -14$

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

$-2(0-1)^2 + 4$
$-2(1) + 4$
$-2 + 4$
2

x	y
2	2
1	4
0	2

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



Opens: down
Axis of Symmetry: $x = 1$
Vertex: $(1, 4)$
Min or Max: 4
Y-intercept: $(0, 2)$
Domain: $\mathbb{R}$
Range: $y \leq 4$

For 8 & 9, complete the square to convert from vertex to standard form.

8. $y = x^2 - 8x + 19$

$y = x^2 - 8x + 16 + 19 - 16$
$(x-4)^2 + 3$

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

vertex: $(4, 3)$

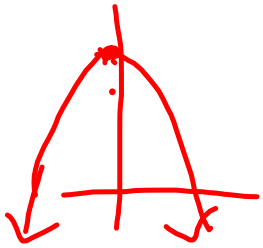
9. $f(x) = 5x^2 + 10x + 7$

$f(x) = 5x^2 + 10x + 5 + 7 - 5$
$5(x^2 + 2x + 1)$
$5(x+1)^2 + 2$

8. $f(x) = 5(x+1)^2 + 2$

vertex: $(-1, 2)$

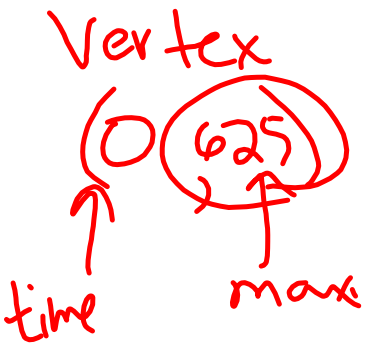
A bird drops a stick from the top of a tower. The height after x seconds is given by f(x)=625 - 16x^2. Graph it! Scroll and/or zoom to explore the parabola.



$f(x) = -16x^2 + 0x + 625$

$x = \frac{-b}{2a} = \frac{-0}{-32} = 0$

What is the maximum height of the bird's stick on the previous slide?



$f(0) = 625 - 16(0)^2 = 625$

625 ft

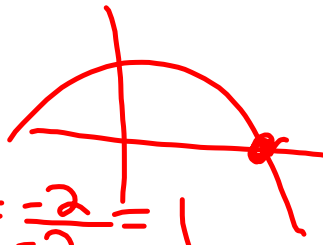
A grasshopper jumps off a tree stump. The height, in feet, of the grasshopper above the ground after x seconds is modeled by, h(x)= -x^2 + 2x + 3

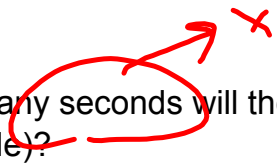
$a=-1$

$b=2$

$c=3$

$x=\frac{-2}{-2}=1$





After how many seconds will the grasshopper land on the ground (use the previous slide)?

$-(1)^2+2(1)+3$

$-1+2+3$

4

max height $(1, 4)$ 4ft