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8.2 #17 (cont'd)

$(m+3)(5m+1) = 3(m-4)+7$

$5m^2+13m+3 = 0$

$m = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$ $\quad a=5,\ b=13,\ c=8$

$m = \frac{-13 \pm \sqrt{(13)^2-4(5)(8)}}{2(5)} =$

$= m = \frac{-13 \pm \sqrt{169-160}}{10}$

$m = \frac{-13 \pm 3}{10}$

$m = \frac{-13+3}{10}$ OR $\frac{-13-3}{10}$

$m = \frac{-10}{10}$ OR $\frac{-16}{10}$

$m = -1$ OR $m = -\frac{8}{5}$

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8.2 #17) (cont'd)

$(m+3)(5m+1) = 3(m-4) + 7$

$5m^2 + 13m + 8 = 0$

$m = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $\quad a=5,\ b=13,\ c=8$

$m = \frac{-13 \pm \sqrt{(13)^2 - 4(5)(8)}}{2(5)} =$

$= m = \frac{-13 \pm \sqrt{169 - 160}}{10}$

$m = \frac{-13 \pm 3}{10}$

$m = \frac{-13+3}{10}$ OR $\frac{-13-3}{10}$

$m = \frac{-10}{10}$ OR $-\frac{16}{10}$

$m = -1$ OR $m = -\frac{8}{5}$

Solving Problems modeled by Quadratic Equations

$h = -16t^2 + 16t + 1200$

h: height; t: time (seconds)

$0 = \underset{a}{-16}t^2 + \underset{b}{16}t + \underset{c}{1200}$

$t = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \dfrac{-16 \pm \sqrt{(16)^2 - 4(-16)(1200)}}{2(-16)}$

$t \approx$ ~~-8.17~~ (extraneous) or 9.17 seconds

★ 8.5 Quadratic functions and their graphs (Lect. Notes. p 145)

★ Examples ★

A) $h(x) = -3(x-4)^2 - 2$

$a = -3,\ h = 4,\ k = -2$

Vertex $(4, -2)$

B) $999(x+1)^2 + 8 = y$

$a = 999,\ h = -1,\ k = 8$

Vertex $(-1, 8)$

C) $g(x) = 7 + (x+9)^2 = (x+9)^2 + 7$

$a = 1,\ h = -9,\ k = 7$

Vertex $(-9, 7)$

D) $f(x) = 9x^2 - 9 = 9(x^2 - 0)^2 - 9$

$a = 9,\ h = 0,\ k = -9$

Vertex $(0, -9)$

$y = -(x-9)^2 + 0$

$a = -1, \quad h = 9, \quad k = 0$

Vertex $(9, 0)$

D: $y = 11x^2$

$y = 11(x^2 - 0)^2$

$a = 11, \quad h = 0 \quad k = 0$

Vertex $(0, 0)$

Problem #27:

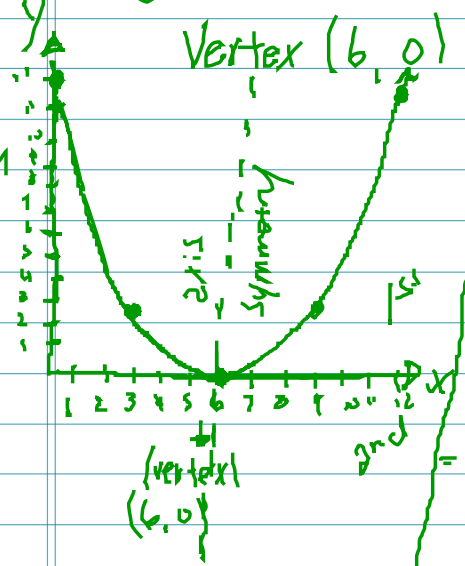
$f(x) = \frac{1}{3}(x-6)^2$

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

$a = \frac{1}{3} \quad h = 6 \quad k = 0$

Vertex $(6, 0)$

Graph



Now plug x values into the equations you started off with

x	y	
0	12	
3	3	
6	0	(vertex / minimum)
9	3	
12	12	

$y = \frac{1}{3}(0-6)^2 + 0$

$= \frac{1}{3} \cdot 36 + 0 = 12$

$(0, 12)$

$= \frac{1}{3}(3-6)^2 + 0 = \frac{9}{3} = 3$

$(3, 3)$

3rd: $\frac{1}{3}(9-6)^2 + 0 = 3$ $(9, 3)$

4th: $\frac{1}{3}(12-6)^2 + 0 = 12$

$(12, 12)$

Problem #26

$f(x) = -3(x+4)^2 + 2$

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

$a = -\frac{3}{1}$ $h = -4$ $k = 2$

vertex $(-4, 2)$

	x	y	
-1	-6	-10	
	-5	-1	
-1	-4	2	vertex/middle
+1	-3	-1	
+1	-2	-10	

Now plug in x values in the equation given in the original problem

1st value: $-3(-6+4)^2 + 2$

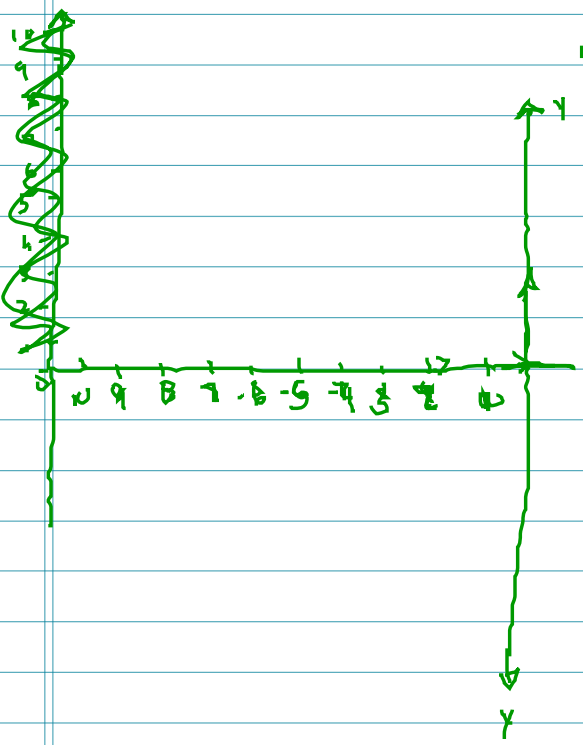
$= -3(-2)^2 + 2 = -10$ $(-6, -10)$

2nd value: $-3(-5+4)^2 + 2$ $(-5, -1)$

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

3rd value: $-3(-3+4)^2 + 2 = -3(1)^2 + 2$

$= -1$ $(-3, -1)$

4th value: $-3(-2+4)^2 + 2 = -3(2)^2 + 2 = -10$

$(-2, -10)$