

Algebra II
Quadratics #3

CW: Class work
HW: Home work

Name Key

- CW** Write an equation of the quadratic in vertex form.
1. passes through (13, 8) and has vertex (3, 2)

Vertex form: $f(x) = \frac{3}{50}(x-3)^2 + 2$

Standard form: $f(x) = 0.06x^2 - 0.36x + 2.54$

- HW** 2. passes through (-7, -15) and has vertex (-5, 9)

Vertex Form

Standard Form

$$f(x) = -(x+5)^2 + 9$$

$$f(x) = -6x^2 - 60x - 141$$

- CW** 3. A baseball is thrown up in the air. The table shows the heights y (in feet) of the baseball after x seconds. Write an equation for the path of the baseball. Find the height of the baseball after 5 seconds. (No GC to find the equation)

Time, x	0	2	4	6
Baseball height	6	22	22	6

SF: $f(x) = -2x^2 + 12x + 6$

VF: $f(x) = -2(x-3)^2 + 24$

$h(5) = 16$

* Other problems done in class are important.

- ~~4.~~ Every rope has a safe working load. A rope should not be used to lift a weight greater than its safe working load. The table shows the safe working loads S (in pounds) for ropes of circumference C (in inches). Write an equation for the safe working load for a rope. Find the safe working load for a rope that has a circumference of 10 inches. (No GC to find the equation)

Circumference, C	0	1	2	3
Safe working load, S	0	180	720	1620

CW/HW

5. The table shows the heights y of a competitive water-skier x seconds after jumping off a ramp. Using your quadratic regression function, write a function that models the height of the water-skier over time. When is the water skier 5 feet above the water? How long is the skier in the air?

Time, x	0	0.25	0.75	1	1.1
Height, y	22	22.5	17.5	12	9.24

$$f(x) = -16x^2 + 6x + 22$$

How long in air?
 $x = \frac{-6 \pm \sqrt{38}}{-32}$ $x = \sqrt{\frac{11}{8}}$ or -1
 ≈ 1.375 sec

when is skier 5ft high?
 $x = \frac{3 \pm \sqrt{281}}{16} \approx -0.8602$ sec
 ≈ 1.2352 sec

HW

6. The table shows the heights h (in feet) of a wrench t seconds after it has been dropped from a building under construction. Using your quadratic regression function, write a function that models the height of the wrench over time. When does the wrench hit the ground?

Time, t	0	1	2	3	4
Height, h	400	384	336	256	144

$$f(x) = -16x^2 + 400$$

Hits ground at 5 sec

HW

7. The table shows the results of an experiment testing the maximum weight y (in tons) supported by ice x inches thick. Using your GC, write a function that models the data. How much weight can be supported by ice that is 22 inches thick?

Ice thickness, x	12	14	15	18	20	24	27
Maximum weight, y	3.4	7.6	10.0	18.3	25.0	40.6	54.3

$$f(x) = 0.0998x^2 - 0.4978x - 5.0072$$

$$f(22) \approx 32.34 = 32.34 \text{ tons}$$