

# Modeling w/ Quadratic Functions (Section 3-3)

\* Using your calculator is important to model complex quadratic functions. \*\* Remember:  $h = -16t^2 + c$  or  $h = -16t^2 + vt + c$

#3  
ex: Basketball to a hoop:  $y = -0.125x^2 + 1.84x + 6$   
Center of hoop:  $(12, 10)$  → over 12, height of 10

- Steps:
- Put function into  $y_1$
  - Input an appropriate window for the graph.

$$\begin{array}{ll} x_{\min} = 0 & y_{\min} = 0 \\ x_{\max} = 20 & y_{\max} = 20 \end{array}$$

③ Graph it.

④ Check the value @  $x=12$  → 2<sup>nd</sup> Trace: Calc

#1 Value:  $x =$   
input 12. →  $y = 10.08$   
∴ the ball will go in.

\* To make a table of values:

Steps: ① Input function into  $y_1$

② 2<sup>nd</sup> Window: Table Set

$$\begin{array}{l}Tbl\ start = 0 \\ \Delta Tbl = 1\end{array}$$

} Pick values that work for the table you want to make.

③ 2<sup>nd</sup> Graph: Table

④ Scroll to find values needed.

ex: (Free fallin' on WS)  $h = -16t^2 + 12,000$  ← initial height of skydiver

\*  $y_1 = -16x^2 + 12,000$  \* window:  $x_{\min} = 0$   $y_{\min} = 0$

$x_{\max} = 30$   $y_{\max} = 15,000$

\* Make a table

\* Table start = 0  
 $\Delta Tbl = 3$

\* Intersecting a parabola at a specific height:

STEPS: ① Input function into  $y_1$

② Input height into  $y_2$

③ Set an appropriate window.

④ Graph.

⑤ 2<sup>nd</sup> Trace: Calc

#5 Intersect: First curve?

Scroll close to intersection: Enter (x3)

\* For an object hitting the ground  $\rightarrow$  make  $y_2 = 0$ .