Lesson 6: Quadratic Models (using the factored form of a quadratic)

To find an equation of "good fit" from a table of data, we must first determine our equation in factored form. From that equation, we can expand to find our standard form.

Curve of good fit: Curve that is very close to the distribution of points in a scatter point.

Example1:

Data from the journey of a golf ball are given in the table. If the maximum height of the ball is 30m, determine an equation for the curve of good fit.

Horizontal distance (m) x	0	30	60	80	90
Height (m) y	0.0	22.0	30.0	27.0	22.5

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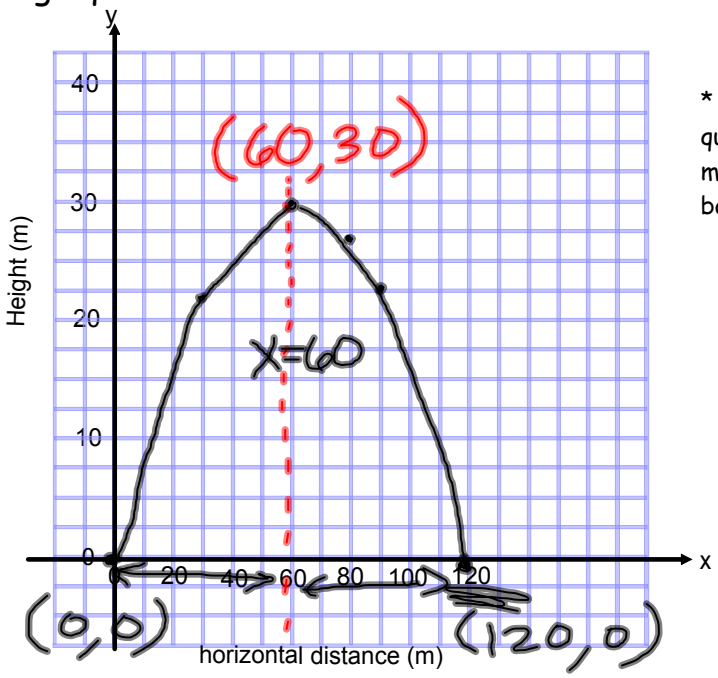
Plot the data on a graph. Be sure to use graph paper for this, because if you don't your graph may not be accurate, resulting in the wrong equation!



* remember that the question told you the maximum height of the ball is 30 m.

Use the factored form to find your equation from the graph:

y = a(x-r)(x-s) * just plug in your zeros

$y = a(x-0)(x-120)$

$y = a(x)(x-120)$

Now find the value of **a** (you know several other points on the graph, you just need to use one). Try using the Vertex. (60,30)

$30 = a(60)(60-120)$

$30 = a(60)(-60)$

$\frac{30}{-3600} = \frac{-3600a}{-3600}$

$-0.008\overline{3} = a$

Equation in factored form:

$y = -0.0083(x)(x-120)$

Expand to change equation to standard form:

$y = -0.0083(x^2 - 120x)$

$y = -0.0083x^2 + 0.996x$

Check by substituting a value of x into the equation.

What is the value of y, when $x = 0$

$y = -0.0083(0)^2 + 0.996(0)$

$y = 0$ ✓

The values should be very close to those in the table. If they are, you know your equation is a good approximation of the data (close fit).

Therefore, the equation of good fit for the data is: