A Farming Problem

Name _____

A farmer is going to build a rectangular fenced-in area for his free-range chickens. He has 24 yards of fencing to use and wants to maximize the area.

1. If he builds a rectangular area with length of 2, what would be the width?

We can now see that the length + width = _____

And of course we know that for a rectangle Area = (_____)(_____)

Fill in the chart to find the different lengths and widths the farmer could choose from. Then find the area.

Length	Width	Area
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		

Now we'll translate our data into coordinate points using the following :
Independent data (x) = _length_   Dependent data (y) = _area_

(___ , ___)   (___ , ___)   (___ , ___)   (___ , ___)   (___ , ___)

(___ , ___)   (___ , ___)   (___ , ___)   (___ , ___)   (___ , ___)   (___ , ___)

Now plot the points to the right:
What shape is the graph?

The equation that fits this data is: $y = -x^2 + 12x$
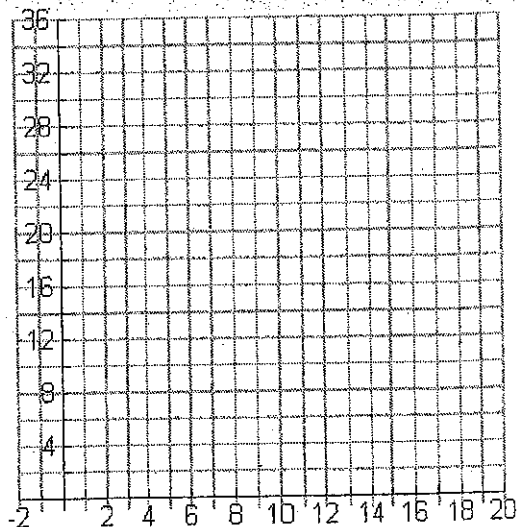
Identify a =   b =   c =

Now find the both the x- and y-coordinate of the vertex

Hint – the x-coordinate = $\frac{-b}{2a}$

Then plug that into your eq. to find y.

Does this answer confirm what we found in the table and graphically?
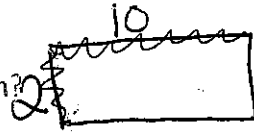
A Farming Problem   Name _____

A farmer is going to build a rectangular fenced-in area for his free-range chickens. He has 24 yards of fencing to use and wants to maximize the area.

1. If he builds a rectangular area with length of 2, what would be the width? 2
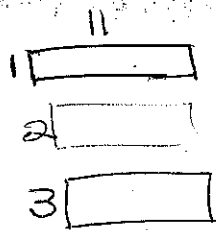
We can now see that the length + width = __12__

And of course we know that for a rectangle Area = (__length__)(__width__)

Fill in the chart to find the different lengths and widths the farmer could choose from. Then find the area.

Length	Width	Area
1	11	11
2	10	20
3	9	27
4	8	32
5	7	35
6	6	36
7	5	35
8	4	32
9	3	27
10	2	20
11	1	11

Now we'll translate our data into coordinate points using the following :
Independent data (x) = __length__   Dependent data (y) = __area__

(1 , 11)   (2 , 20)   (3 , 27)   (4 , 32)   (5 , 35)

(6 , 36)   (7 , 35)   (8 , 32)   (9 , 27)   (10 , 20)   (11 , 11)

Now plot the points to the right:
What shape is the graph? Parabola

The equation that fits this data is: $y = -x^2 + 12x$

$x(12-x)$
$12x - x^2$
$-x^2 + 12x$

Identify a = -1 b = 12 c = 0

Now find the both the x- and y-coordinate of the vertex   (6, 36)

Hint - (the x-coordinate = $\frac{-b}{2a}$)

Then plug that into your eq. to find y. $\frac{-12}{(2 \cdot -1)} = \frac{-12}{-2} = 6$

$y = -(6)^2 + 12(6) = 36$

Does this answer confirm what we found in the table and graphically? ____
6   To maximize area,
           6 by 6.