Fencing the Dog Yard	Name
TI-Nspire Investigation from MathBits.com	m 1 3.5
Directions: Grab your TI-Nspire and read carefully!	· Si sel
1. Get the dogyard.tns file loaded onto your TI-Nspir	e. (1.1 1.2 1.3) ★ *dogyard 《 🕅 🗙
Open the document dogyard.tns	γ Fencing the Dog Yard
open the document dogy in daths	Calculator activity to follow
	investigation of the relationship of a fixed
	perimeter to area.
	created by: Donna Roberts MathBits.com
2. On page 1.3 you will see a rectangle with a fixed	 <1.2 1.3 1.4 ▶ *dogyard ▼ III III
perimeter of 20 cm, which will simulate your paper cli	p perimeter=20 cm length=6.39 cm
fencing.	width=3.64 cm
Grab and drag the lower right vertex (the point) of the	
rectangle and observe the changes in the length, width, area and perimeter.	
•	the second se
Pay particular attention to the changes in the area and t shape of the rectangle.	
	area =23.3
Obsrevation: What appears to be happening to the	e area of the rectangle as the vertex is moved?
3. You are now ready to start collecting data from the	moveable rectangle to further investigate this
situation. From your rectangle, on page 1.3, you will r	now collect data that will be placed in the
spreadsheet on page 1.5. By moving the lower right vertex, place the rec	stangle in a variety of shapes, and press
"CTRL, period" after each shape to collect the	
CIRL , period after each shape to conect the	
	Alen Bwid Carea1 E F
	=captul =captul
The length, width and area of each of your choser	
rectangles will appear in their respective columns in t	the 2
spreadsheet.	

4. On page 1.7, you will create a scatter plot to graph your data.	Nard ∰ Xard ∰ Xard ₩ Xard ₩
	4: 3: Graph Type → ₩ 1: Function ↓ 4: Window / Zoom → 4 2: Parametric
For a scatter plot, choose Menu, #3 Graph Type and #4	/戊 5: Trace → 🖓 3: Polar ﷺ 6: Analyze Graph → 👫 4: Scatter Plot
Scatter Plot.	7: Poirts & Lines ↓ 🖳 5: Sequence ↓
	S ¹ _{ν←} S ¹
5. Hit Var: Choose the <i>x</i> -axis to be len.	1.6 1.7 1.8 ▶ *dogyard ▼
Hit Warry Change the serie to be seried	6.67 V
Hit Var: Choose the y-axis to be area1.	
Hit Menu – 4 – 9 for Zoom Data.	
	-10 1 10
	≪ s1 (^{™™} ν ← γ €
Observation: Does the graph support your thoughts about	
you think there will be a maximum area for this problem? If	Explain.
6. It is time to look at the statistics for this data and obtain	
a representative model equation (a regression equation).	1: Actions →, *dogyard 《 《 》 ⊠ ™ 2: Insert →
Is this the "name" you chose for your paper clip graph?	135 3: Data ● area1 ■ ■ F ▲ ▼ 4: Statistics ● 1: Stat Calculations ●
Return to page 1.5.	🛱 5: Table 🔸 2: Distributions 🔹 🔸 🔤
Click a cell in Column E .	③ 6: Hints 3: Confidence Intervals ↓ 4: Stat Tests ↓
Choose Menu #4 Statistics, #1 Stat Calculations, #6	2
Quadratic Regression	И П П П П П П П П П П П П П П П П П П П
Choose X List = len	
Y List = area1 Save to f1	
7. Return to the graph, page 1.7.	▶ 1: Actions Vard ▼ ▶ 40 King Nard
retuin to the graph, page 1.7.	₩ 2: View
Choose Menu #3 Graph Type, #1 Function	4는 3: Graph Type → ₩.1: Function 1귳 4: Window / Zoom → ♣.2: Parametric
	/î, 5: Trace → 🍕 3: Polar ýg 6: Analyze Graph → 其 4: Scatter Plot
Arrow up to $fl(x)$ if it is not visible.	7: Points & Lines ↓ 🖳 5: Sequence ↓
Lit ENTED You will see the graph on top of the gootter	() 9: Shapes 1 10
Hit ENTER. You will see the graph on top of the scatter plots. You may need to adjust the window.	X A: Construction B: Transformation
prois. Tou may need to adjust the willdow.	 C: Hints
	≫ -6.67

8. Now, let's find that maximum area.	40 y 40	
Choose Menu #6 Analyze Graph - #3 Maximum. Move the hand until the Maximum appears.	(5.01, 25.1)	
You answer will not, necessarily, be the same as the one shown at the right.	$f1(x) = -1. \cdot x^{2} + 10. \cdot x + -2.79 = -\frac{x}{20}$	
Observation: To the nearest tenth, that is the maximum possible area of your dog yard?		
What are the dimensions that create this dog yard? State both length and width.		
Conclusion: Would the dog yard of maximum area be the BEST shape for the dog yard? Explain your answer, listing factors that would affect your decision.		
What are the dimensions that create this dog yard? State both length and width. Conclusion: Would the dog yard of maximum area be the BEST shape for the dog yard? Explain		

Comparison: When you built the dog yard with the paper clips, you used only integer values for the lengths of the sides of the pen. At the bottom of your table (chart) for that activity, you represented the length, width and area in terms of x. Plot the area you listed in that table onto page 1.7 along with your other graph.

How does that initial equation compare with the quadratic regression equation?

Explain why you did not get the "exact" (best fit) equation using the paper clips.