

Reminders: Please show all your work neatly on this worksheet.

This should be some of your most careful work!

Name: _____

	<i>Show your work neatly (when relevant).</i>	<i>Copy down your final answer.</i>
1.	Give the <u>domain</u> and the <u>range</u> of the quadratic function: $f(x) = 2(x - 1)^2 + 3$ Show any work needed to find the domain/range. Use set builder notation for the range.	
2.	Give the <u>domain</u> and the <u>range</u> of the quadratic function: $f(x) = -x^2 - 12x + 28$ Show any work needed to find the domain/range. Use set builder notation for the range.	
3.	Does the following quadratic have a <u>maximum</u> or a <u>minimum</u> ? Explain how you know this. <u>Give the maximum/minimum value</u> of the function. $f(x) = 3x^2 - 7x + 6$	
4.	Give $f(x) = x^2 + 8x + 3$ a) in <u>vertex form</u> b) Use vertex form to give the <u>ordered pair representing the vertex</u> . c) Use vertex form to find the <u>x-intercepts</u> . List the x-intercept(s) as ordered pairs. Give an exact answer using simplified radicals.	a) b) c)
5.	For each quadratic, will the graph have <u>0, 1 or 2 x-intercepts</u> ? Support your answer with the discriminant. Show work for the discriminant computation and the value. a) $f(x) = x^2 + 8x + 3$ b) $f(x) = 2x^2 + x + 3$ c) $f(x) = 9x^2 - 12x + 4$ d) $f(x) = 2x^2 + 6x$	a) b) c) d)

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6.	<p>Put $f(x) = x^2 + 4x - 32$ in <u>factored form</u> and use factored form to find</p> <p>a) the <u>x-intercepts</u></p> <p>and</p> <p>b) the <u>x-coordinate of the vertex</u>:</p> <p>Show all work.</p>	<p>a)</p> <p>b)</p>																				
7.	<p>A rancher needs to enclose a pasture, but he only has 100 yards of fencing to complete the job. This means that the width will be 50 yards minus the length. What are the dimensions of the pasture? What is the maximum area that can be enclosed by the 100 yards of fencing? Show all work.</p>																					
8.	<p>A person standing close to the edge of a 160 foot building throws a baseball up and the height of the baseball at time t after it has been reached at time t can be described by the equation: $h(t) = -16t^2 + 64t + 160$</p> <p>a) Find the time it takes for the baseball to reach its maximum height.</p> <p>b) Find the maximum height the baseball will reach.</p> <p>c) What does the y-intercept represent in this equation?</p> <p>d) How long will it take the ball to hit the ground? Round to one decimal if necessary.</p>	<p>a)</p> <p>b)</p> <p>c)</p> <p>d)</p>																				
9.	<p>The weekly profit for Virtual Fido takes in based on the sale of x products can be described by $P(x) = -x^2 + 980x - 3000$. What is the maximum weekly profit of Virtual Fido? Show all work.</p>																					
10.	<p>The percentage of people living in the US who are immigrants are shown as a percent as a function of years since 1900.</p> <table border="1" data-bbox="224 1675 704 1950"> <thead> <tr> <th>Years Since 1900, t</th> <th>Percentage, P</th> </tr> </thead> <tbody> <tr><td>30</td><td>12</td></tr> <tr><td>40</td><td>9</td></tr> <tr><td>50</td><td>7</td></tr> <tr><td>60</td><td>6</td></tr> <tr><td>70</td><td>5</td></tr> <tr><td>80</td><td>6</td></tr> <tr><td>90</td><td>8</td></tr> <tr><td>100</td><td>11</td></tr> <tr><td>107</td><td>13</td></tr> </tbody> </table>	Years Since 1900, t	Percentage, P	30	12	40	9	50	7	60	6	70	5	80	6	90	8	100	11	107	13	<p>a)</p> <p>b)</p>
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	<p>a) Choose a point to be your vertex. Hint: Think symmetry. b) Use that vertex to appropriately fill in $P(t) = a(t - h)^2 + k$ c) Use your calculator to draw a scattergram of the data. Choose another point that seems to lie on the “imaginary parabola” you are beginning to construct. d) In the vertex form in part b), fill in the $(t, P(t))$ that you chose in part c). e) Simplify d) and solve for “a”. Round “a” to 3 decimals if necessary.</p> <p>f) Rewrite your model from b) including the “a” that you found in e).</p>	<p>c) d) e) f)</p>
<p>11-12</p>	<p>For the quadratics in 11 & 12 give all the requested information and graph them together on the graph provided. Show all work.</p> <p>a) Indicate whether the parabola will face up (have a minimum) or down (have a maximum) and indicate why. b) Give the vertex (as an ordered pair) c) Give the y-intercept (as an ordered pair) d) Give the x-intercept(s) if they exist (as an ordered pair; after showing exact values round to one decimal to graph, if necessary) e) Use the graph and symmetry to find and label a 5th point symmetry to the y-intercept.</p>	

Note: If your parabola doesn't have 5 points, you will need to use substitution to find some and symmetry to find a few more. Indicate any such work in part e).

11. The quadratic function is: $f(x) = x^2$

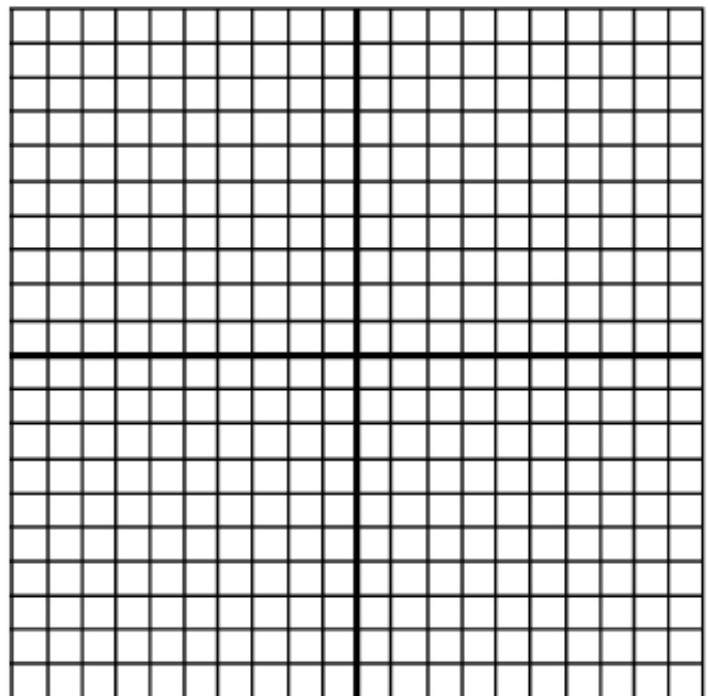
a)

b)

c)

d)

e)



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12. The quadratic function is: $f(x) = (x - 3)^2 - 5$

a)

b)

c)

d)

e)

13. Discuss how the parabolas in problems 11 & 12 relate to one another. Make observations about the movement of the vertex of 12 with respect to 11.