

DO NOT TURN THIS PAGE UNTIL YOU ARE INSTRUCTED TO DO SO

- ❖ Write your name below on the space provided.
- ❖ This test has a total of 4 pages.
- ❖ Work the problem in the space provided. If you need more space, write on the back of the test.
- ❖ To insure maximum credit, show your work. In general, full credit will not be given for unsupported answers.
- ❖ Look only at your test. Don't give me the impression that you are cheating.
- ❖ Be sure to write neatly. If I cannot read what was written, do not expect the problem to be graded.
- ❖ If you finish early, go over the test again.

Good luck!

Number	Maximum	Score
1	2	
2	8	
3	6	
4	10	
5	10	
6	6	
7	10	
8	2	
9	3	
10	18	
11	9	
12	6	
13	10	
Total	100	

Name _____

Circle Final Answers

1) (2 points) What are the four ways to solve a quadratic equation?

2) (4 points each) Solve for the variable:

a) $x^2 - 36 = 0$

b) $-4(x+1)^2 + 6 = 5$

3) (3 points each) Fill the blank with the number necessary to complete the square and then factor.
Show all necessary work:

a) $x^2 - 20x + \underline{\hspace{2cm}}$

b) $x^2 + x + \underline{\hspace{2cm}}$

4) (5 points each) Solve by completing the square:

a) $x^2 + 8x + 12 = 0$

b) $3x^2 + 8x + 12 = 0$

5) (5 points each) Solve by using the quadratic formula:

a) $x^2 - 4x + 9 = 0$

b) $3x^2 + 8x + 12 = 0$

6) (6 points) The wildly unpopular musical “Catcher in the Wheat” is causing theater managers to increase ticket prices to make ends meet. Currently, the prices are set at \$14.00 per ticket and brings in an average crowd of 560 per show. They've found that, for every \$2.00 the ticket prices increase, they will lose 10 people. If they need to bring in \$19,000 per show to stay afloat, what should the new ticket prices be? Let x be the number of times the prices are increased. *Note: There are two possible answers. Do they both work for this situation?*

7) (5 points each) Solve for the variable:

a) $x^4 - 13x^2 + 12 = 0$

b) $4x^{\frac{2}{5}} + 5x^{\frac{1}{5}} - 6 = 0$

8) (2 points) Where is the vertex of the quadratic function $f(x) = -3(x + 6)^2 + 7$ located?

9) (3 points) Explain the transformations necessary to sketch the graph of $f(x) = -3(x - 7)^2 + 1$:

10) (3 points each) For the function $f(x) = x^2 + 2x - 8$, find...

a) The vertex:

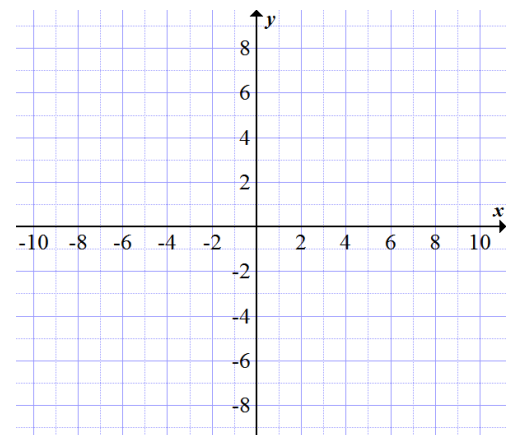
b) The x -intercepts:

f) The graph:

c) The y -intercept:

d) The domain:

e) The range:



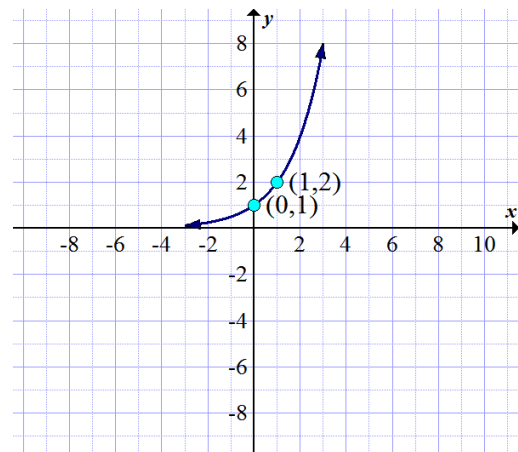
11) (3 points each) After retiring for the tough javelin-throwing lifestyle, Jo Jo Ba decides to take up leftover carved pumpkin throwing. A particular pumpkin follows a path given by the equation $h(t) = -16t^2 + 48t + 10$ where t is time in seconds and h is height off of the ground.

- a) Find the time at which the pumpkin will be the highest off the ground: b) Find the highest height the pumpkin will be in the air.

c) Find the time when the pumpkin will hit the ground. Round to two places:

12) (3 points each) For the function $f(x) = 4 \cdot 2^{x-5} - 6 \dots$

- a) Describe the transformations necessary to sketch the graph b) Sketch a graph of the transformation using the graph $y = 2^x$ below. Be sure to label the transformed points and asymptote:



13) (5 points each) Solve for the variable in the equations:

a) $2^{4x-8} = 16$

b) $5 \cdot 125^{3x-1} = 25^{2x+1}$