Math II: 1st Semester Material Pre-Test

Unit 1: Extending the Number System

1. Circle all the subsets that would describe the following number (8 points):

0

Complex	Natural
Integers	Rational
Irrational	Real
Whole	Prime

2. Using the Properties of Exponents simplify the following expressions (2 points).

A. $3x^{-4}y^4 \cdot 3y^2 \cdot 3yx^5$

3. Rewrite the following radical using rational exponents (2 points):

$\sqrt[3]{15}$

4. Rewrite the following rational exponent expression in radical form (2 points):

$(xy)^{\frac{2}{5}}$

5. Write an equation that represents each of the following scenarios (2 points each = 8 points total):

A family is a food vendor at the local fair and sells their cotton candy for $6 per bag. The family pays $250 to have their stand and sell n bags.
The initial population of bacteria is 250 micrometers. The population will double every 6 hours.
Hoopeston Sports Boosters invest $3000 in hoodies to show support for the football team. They sell the hoodies for $25 each and sell n of them.
The initial population of bacteria is 3000 micrometers. The population will cut in half every 25 hours after the initial dose of medication is taken.

Unit 2A: Quadratic Functions – Representations

6. Find the sum (2 points).

$(7x + 2x^2 - 5x^4) + (3 + x^4 + 9x^2)$

7. Find the difference (2 points).

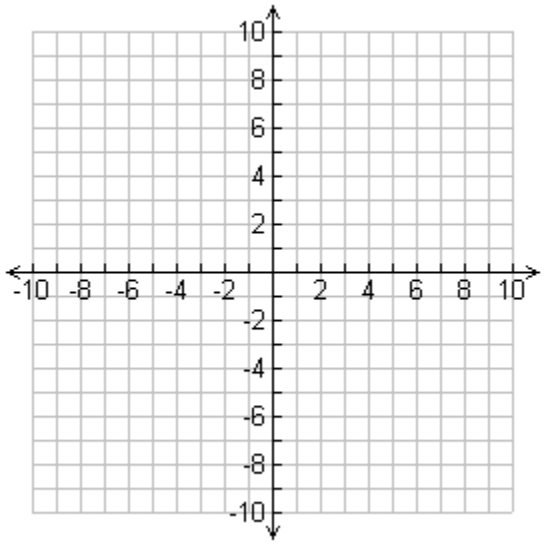
$(7x + 2x^2 - 5x^4) - (3 + x^4 + 9x^2)$

8. 8. Graph each of the following functions:

$f(x) = -x^2 - 8x - 7$

A. Find the Axis of Symmetry (2 points):

B. Create a Table of Values & graph (2 pts):



C. Identify the Vertex of the function (2 pts):

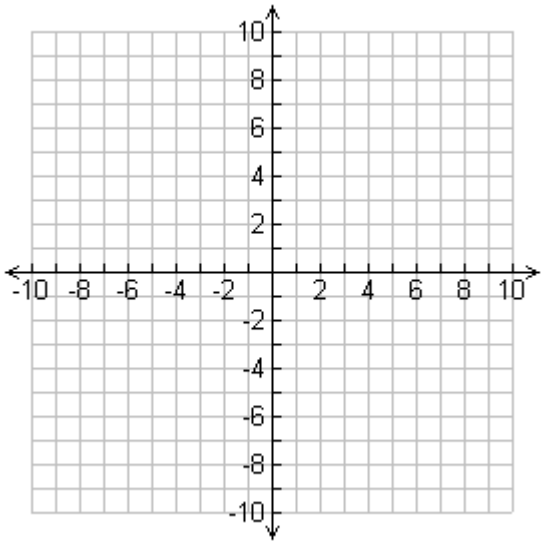
D. Identify the y-intercept of the function (2pts):

E. Identify the x-intercept of the function (2pts):

$f(x) = (x-1)^2 - 9$

A. Find the Axis of Symmetry (2 points):

B. Create a Table of Values & graph (2 pts):



C. Identify the Vertex of the function (2 pts):

D. Identify the y-intercept of the function (2pts):

E. Identify the x-intercept of the function (2pts):

Unit 2B: Quadratic Functions – Modeling

9. Write an equation for each of the following scenarios (2 points each = 8 points total):

A. Khloe is on top of a bridge overlooking the river and asks if she can throw a rock over the side. She throws the rock upward at 32 feet per second from a height of 450 feet	
B. Mr. Brewer wants to put a little garden in the back yard for the kids. To keep the animals out of it they want to fence the garden in. At the moment they have a patch of land in mind that is 250 feet by 50 feet.	
C. A construction crew is building another sky scraper in New York and has a guy 1500 feet above ground. He is chewing a piece of gum that is old and throws it down at 16 feet per second.	
D. Bryson and Khloe want to create a lemonade stand to help support another little girl that they know who shares the same heart condition as Khloe does. They are currently selling lemonade for $1 a cup and are selling 400 cups per day. If they increase their sales by increments of $0.50 they think they will only lose 20 customers per increase since it is for such a good cause.	

10. For each of the following functions state if the vertex would be a **MAXIMUM** or a **MINIMUM** (1 point each):

A. $A(x) = 2x^2 + 20x - 150$	B. $C(r) = -r^2 - 22r - 40$

Unit 2C: Quadratic Functions – Working with Equations

11. Simplify the following square roots (2 points each).

A.	B.
$\sqrt{704}$	$\sqrt{-468}$

12. Perform the indicated operation on the Complex Numbers (2 points each):

A.	B.
$(8-6i)+(4-3i)$	$(-2+7i)-(6-3i)$
C.	D.
$(2+7i)(2-4i)$	$\frac{3+5i}{-6-7i}$

13. Solve the following Quadratic equations using any method of your choosing (2 points each).

A.	B.
$10x=-24+x^2$	$40x+25=-16x^2$