Name Date: Class: Team: Student #:

Math II Honors Final Exam Review

Score:

Directions: This is just a sample of the problems you may see on the exam and doesn't include all types of problems you may see on the exam. You will need to also use the other resources listed to fully study & prepare for your Math II Honors final exam. Show all work below. Be sure to label your answers appropriately!

Don't Forget to use your TIPS

TI: Underline/Highlight Terms and Information

P: Problem is worked out

S: Solution is in a complete sentence

Unit 1-Transformations

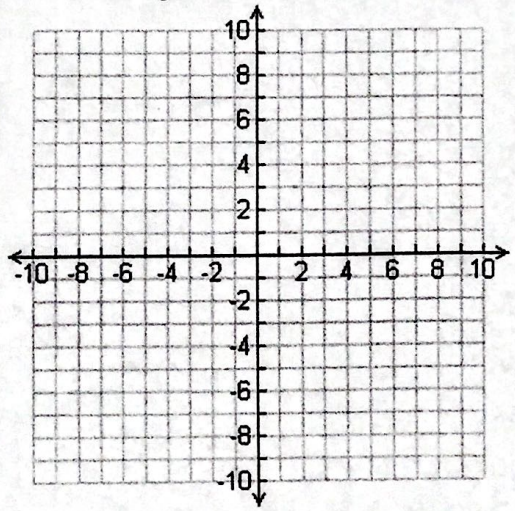
Vocabulary

Match each word with its correct definition.

_____ 1. Translation	a. the original figure prior to a transformation
_____ 2. Image	b. two angles whose measures add up to 90 degrees
_____ 3. Rotation	c. two angles whose measures add up to 180 degrees
_____ 4. Reflection	d. the new position of a figure after a transformation
_____ 5. Preimage	e. a mirror image is created of a figure over a line
_____ 6. Congruence Motion	f. the motion of a figure around a fixed point
_____ 7. Complementary Angles	g. moving every point the same distance in the same direction
_____ 8. Supplementary Angles	h. location of a figure is changed, but not the size or the shape
	i. a mirror image is created of a figure over a line

Plot the points, apply the given transformation, state the points of the image, and state the rule used. Label the Pre-image and image.

1. Plot the following points for the figure: N(-5,9) P(-2,3) O(-10,-3)
Rotate triangle NOP 180° clockwise.



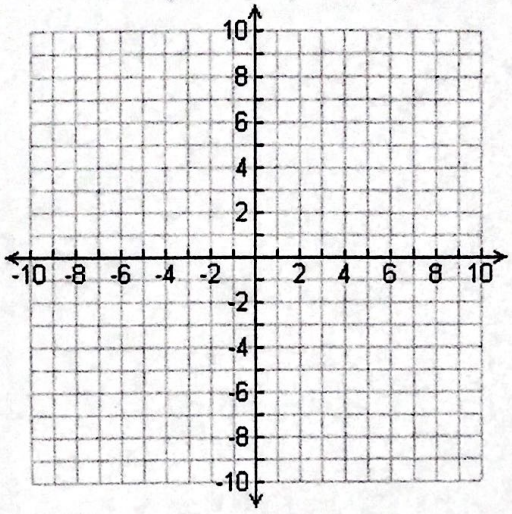
Answer:

N' _____ P' _____

O' _____

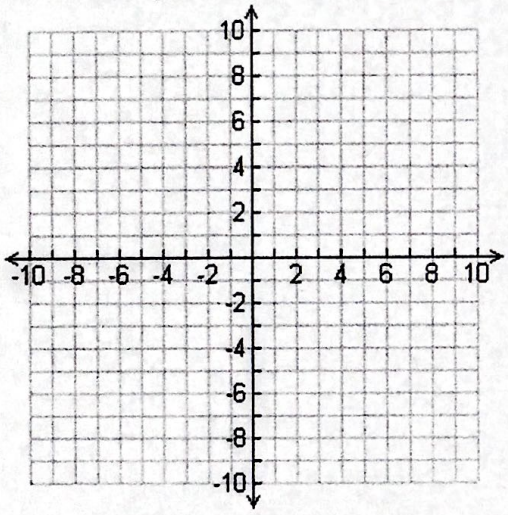
State the rule:

2. Plot the following points for the figure: S(6,8) Q(10,5) R(1,1)
Reflect triangle SQR over the y-axis.



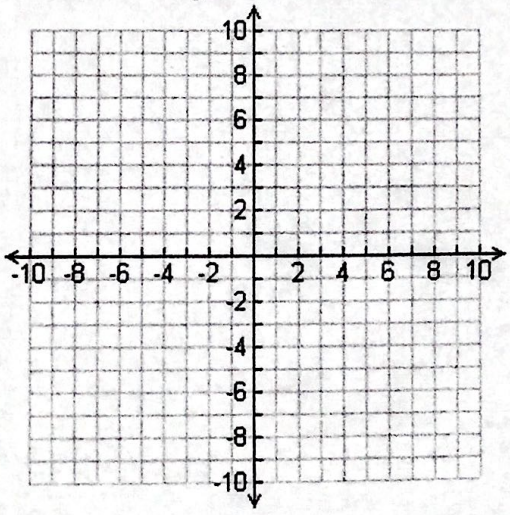
S' _____ Q' _____
R' _____
State the rule:

3. Plot the following points for the figure: T(-5,9) U(-2,3) V(-10,-3)
Rotate triangle NOP 90° clockwise.



Rotate triangle NOP 90° clockwise.
T' _____ U' _____ V' _____
State the rule:

4. Plot the following points for the figure: W(3,4) X(2,6) Y(0,0)
Translate triangle WXY 2 units left and 3 down.



W' _____ X' _____
Y' _____
State the rule:

Unit 2-Quadratic Functions

Vocabulary
Match each word with its correct definition.

a. quadratic formula b. vertex c. discriminant
d. axis of symmetry e. standard form of a quadratic equation

_____ 1) a number that can be calculated from any quadratic equation. It is found by using the formula: _____-
_____ 2) divides the parabola into two congruent halves
_____ 3) a function that can be written in the form $ax^2 + bx + c$ of ordered pairs
_____ 4) represents the maximum or minimum point of the parabola
_____ 5) one method used to solve a quadratic equation. The formula can be written as :
_____

1. Solve the following quadratic equation by factoring, taking the square root, or using the quadratic formula. Show work. ***Hint: Make sure it's in standard form first.***
$2x^2 - 5 = 3x$

Answer:

2. a) Given the following function $y = (x + 2)^2 - 4$, explain the transformation from the parent function $y = x^2$. Use words.

b) What are the zeroes of : $4x^2 - 9 = 0$?

Answer:

3. The heights of two different projectiles after they are launched are modeled by f(x) and g(x). The function f(x) is defined as $f(x) = -16x^2 + 42 + 12$. The table contains the values for the quadratic function g.

x	f(x)
0	9
1	33
2	25

What is the approximate difference in the heights achieved by the two projectiles?
Show work:
Maximum height of f(x) Maximum height of g(x)

Answer:
A. 0.2 feet

B. 3.0 feet

C. 5.4 feet

D. 5.6 feet

4. Macy's is planning their annual fireworks celebration for the 4th of July. A company has given them the following information about their fireworks.

a) Find the Quadratic Model for the given table.

b) Find the maximum height of the fireworks.

c) At what distance are the fireworks at their maximum height?

Time (x)	Height (y)
1	134
2	186
3	206
4	194
5	150
6	74

Answer:

a) Quadratic Regression:

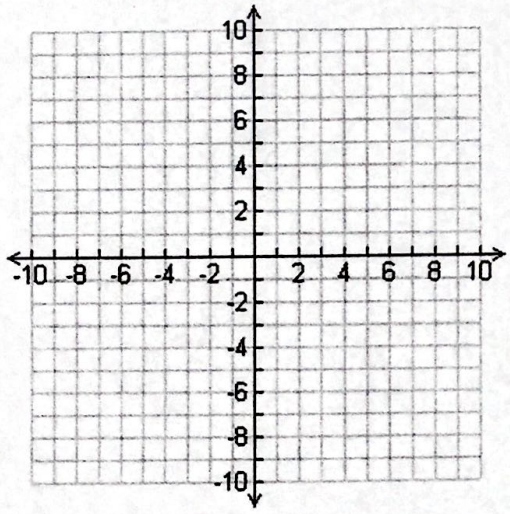
b) Vertex:

c)

5. Without using a calculator, fill in the table and graph the function: $x^2 + 2x - 8 = 0$.

Show all work below:

x-intercept(s)	y - intercept	vertex	Axis of Symmetry



Answer:

Vocabulary
Write the formula for the following:

_____ 1. Half-life

_____ 2. Exponential Growth
Growth Rate- _____ Growth Factor- _____

_____ 3. Exponential Decay
Growth Rate- _____ Growth Factor- _____

1 Simplify $\sqrt[3]{128a^{13}b^6}$.

Answer:
A. $2a^4b^2\sqrt[3]{4a}$
B. $4a^4b\sqrt[3]{a}$
C. $4a^4b^2\sqrt[3]{2a}$
D. none of these

2. Convert the expression to radical form: $(10n)^{\frac{3}{2}}$

Answer:

3. Find the inverse of each function.

$f(x) = \frac{x-6}{5}$

Answer:
A. $f^{-1}(x) = \frac{x+6}{5}$
B. $f^{-1}(x) = 5x+6$
C. $f^{-1}(x) = 5(x+6)$
D. $f^{-1}(x) = \frac{5}{x-6}$

4. Solve each equation.

$2(10^x) = 200$
Show Work:

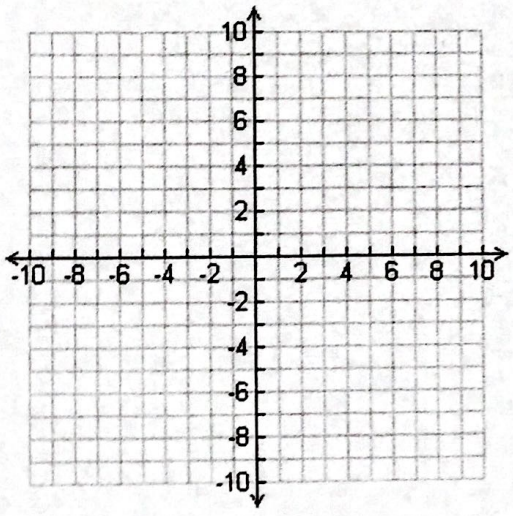
$(x+4)^{\frac{5}{6}} = -3$
Show Work:

Answer:
a)

b)

5. An initial population of 775 quail increases at an annual rate of 18%. Write an exponential function to model the quail population.

Answer:
A. $f(x) = 775(1.18)^x$
B. $f(x) = 775(1.018)^x$
C. $f(x) = (775 \cdot 0.018)^x$
D. $f(x) = 775(0.18)^x$

6. A 200-gram sample of a certain radioactive substance has a half-life of 10 minutes. a) Write an exponential function to model its decay. Define your variables. b) Find the amount of the substance left after 25 minutes. Show work!	**Answer:** a) b)
7. A popular antique is gaining value because it is so hard to find. In 1970, its value was \$100, and in 2000, its value is \$750. a) Use an exponential regression to determine the function that models the value of the antique x years after 1970. Round to 3 decimals places. b) If the same trend continued, how much is the antique worth in 2015?	**Answer:** a) b)
8. Complete the following for the function: $y = \log(x+3) - 2$ **a) Describe the transformations from the parent $y = \log(x)$.** **b) Find the domain.** **c) Find the range.** **d) Write the equation of the asymptote.** **e) Graph the function. Include the asymptote and at least two accurate points on your graph.**  	**Answer:** a) b) c) d)

Unit 4-Advanced Functions

Vocabulary

Identify the equation of the parent function and sketch a graph of the parent function.

_____ 1. Absolute Value Function

Sketch:

_____ 2. Exponential Function

Sketch:

_____ 3 Greatest Integer Function

Sketch:

_____ 4. Quadratic Function

Sketch:

_____ 5. Square Root Function

Sketch:

_____ 6. Cube Root Function

Sketch:

_____ 7. Logarithmic Function

Sketch:

_____ 8. Inverse Variation Function

Sketch:

_____ 9. Sine Function

Sketch:

_____ 10. Cosine Function

Sketch:

_____ 11. Tangent Function

Sketch:

_____

Sketch:

1. The graph of $f(x) = x^2$ will be translated 5 units up and 2 units to the right. Which function in standard form describes the graph produced by the translations? **Show work:**

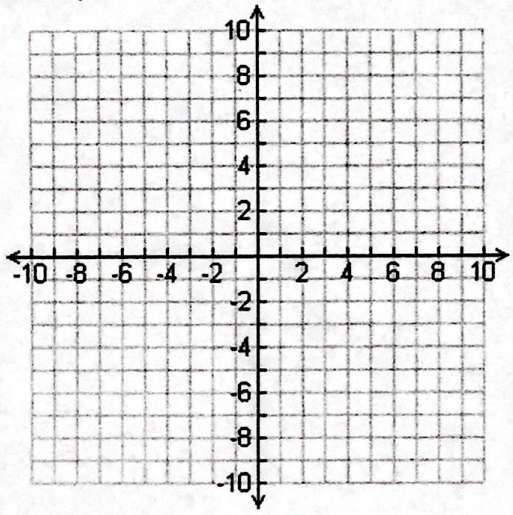
Answer:

A. $g(x) = x^2 + 10x + 23$

B. $g(x) = x^2 - 4x + 9$

C. $g(x) = x^2 + 4x - 1$

D. $g(x) = x^2 - 10x + 27$

2. The volume, V, of a certain gas varies inversely with the amount of pressure, P, placed on it. The volume of this gas is 175 cm^3 when 3.2 kg/cm^2 of pressure is placed on it. What amount of pressure must be placed on 400 cm^3 of this gas? **Show work:**	**Answer:** A. 1.40 kg/cm^2 B. 1.31 kg/cm^2 C. 7.31 kg/cm^2 D. 2.86 kg/cm^2
3. The distance traveled at a constant speed is directly proportional to the time of travel. If Nia traveled 112 miles in 3.5 hours, how many miles will Nia travel in 8.9 hours at the same constant speed? **Show work:**	**Answer:** A. 99.6 mi B. 284.8 mi C. 172.8 mi D. 124.4 mi
4. Evaluate $f(x) = \begin{cases} 2x+5 & x<-1 \\ x^2-3 & -1 \le x \le 2 \\ -3x+7 & x>2 \end{cases}$ **Show Work:** a. $f(-5)$ =_____ b. $f(-1)$ = _____ c. $f(6)$ = _____	**Type of Function:** **Answer:**
5. State the following using the function: $f(x) = -\sqrt{x}+2$ (6 pts) a. Describe the transformation from the parent graph of $f(x) = \sqrt{x}$. b. Domain: Range: c. Describe end behavior: As x → _____ y → _____ and as x →_____ y →_____. d. Graph 	**Type of Function:** **Answer:** a) b) c)

6. State the following using the function: $f(x) = 3|x + 1|$ (8 pts)

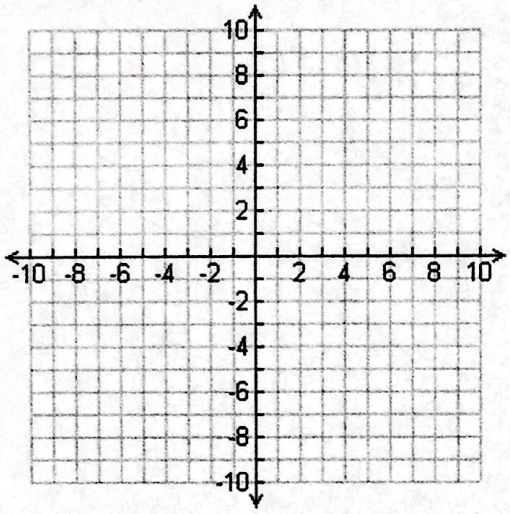
a. Describe the transformation from the parent graph of $f(x) = |x|$

b. Domain: Range:

c. Vertex: Axis of Symmetry:

d. End Behavior: $x \to -\infty$, _____, $x \to \infty$, _____

e. Graph



Type of Function:

Answer:

a)

b)

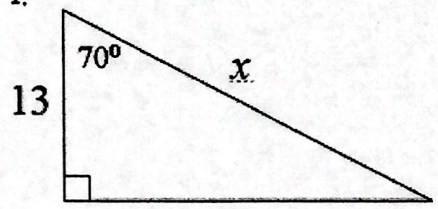
c)

d)

Unit 5-Trigonometric Functions

Label each right triangle with stick man, and the sides (H, O, or A). Write the Trig Equation and then solve. Show all work.

1.



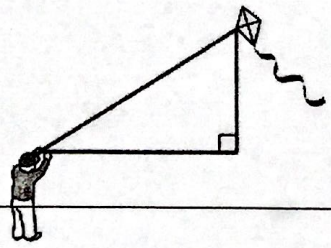
Trig Function:

Show Work:

Answer:

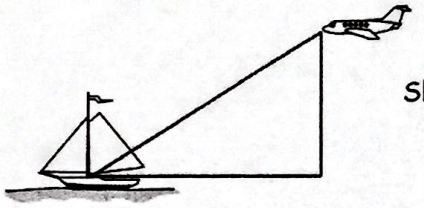
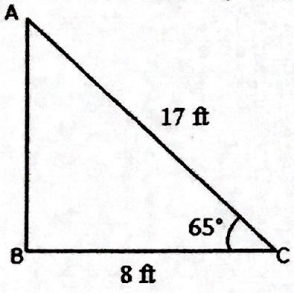
2. Damali is flying a kite as shown. The kite is on a 30 foot string and the string is at a 35° angle of elevation. If Damali is holding her end of the string 5 feet above the ground, how far from the ground is the kite?

Trig Function:



Show Work:

Answer:

3. A pilot sees a boat at a 25° angle of depression. If the altitude of the plane is 2000 feet, what is the distance between the plane and the boat? Trig Function:  Show Work:	**Answer:**
4. Draw a diagram. Label each right triangle with stick man, and the sides (H, O, or A). Write a trig equation and solve. An airplane took off from a runway. When the plane had flown 300 meters, it had covered a horizontal distance of 290 meters. Find the measure of the angle of elevation of the airplane's path. Picture: Trig Function: Show Work:	**Answer:**
5. Find the area of each triangle. Area = $\frac{1}{2} \cdot a \cdot b \cdot \sin C$  Show Work:	**Answer:**

Unit 6-Probability	
Complete the following: A sample space is _____. The set (A and B) is _____. The set (A or B) is _____. P(A) = the probability that A occurs = The sum of the probabilities of all the events in a sample space should always equal _____. $P(A^c)$ = the probability that A does not occur = P(A or B) = Events are mutually exclusive (disjoint) if _____. If A and B are mutually exclusive, then P(A or B) = Events are independent if _____. Two events are independent if and only if P(A and B) = _____. P(B|A) = the probability of B given A has already occurred =	
1a) An experiment consists of tossing 2 coins (a nickel and a dime) and observing the outcomes. List the sample space. 1b) A popular brand of pen is available in three colors (red, green or blue) and four tips (bold, medium, fine or micro). How many different choices of pens do you have with this brand? Show work:	**Answer:** a) b)
2. There are 240 seniors at Mouse Academy. Seventy of those seniors take Calculus or Physics, 40 take Calculus, and 55 take Physics. a) Find the probability that a randomly chosen senior at Mouse Academy takes both Calculus and Physics? b) What is the probability that a randomly chosen senior at Mouse takes neither Calculus nor Physics?	**Answer:** a) b)
3. You put a CD that has 8 songs in your CD player. You set the player to play the songs at random. The player plays all 8 songs without repeating any song. What is the probability that the songs are played in the same order they are listed on the CD? **Show work:**	**Answer:**

4. There are 35 students in your PE class. Five of these students will be selected randomly to represent your class on a 5-person bowling team. What is the probability that the team chosen will be Sally, April, John, Fred and Adam? **Show work:**	**Answer:**
5a. Explain the difference between theoretical and experimental probability. 5b. What is the theoretical probability of rolling a 6? _____	**Answer:** a) b)
6. Suppose you have a jar of candies: 4 red, 5 purple and 7 green. Find the following probabilities of the following events: a) Selecting a red candy. b) Selecting a purple candy. c) Selecting a green or red candy. d) Selecting any color except a green candy. e) Find the odds of selecting a red candy. f) Find the odds of selecting a purple or green candy.	**Answer:** a) b) c) e) f)