

Quiz 7/8 – Math 112 College Algebra

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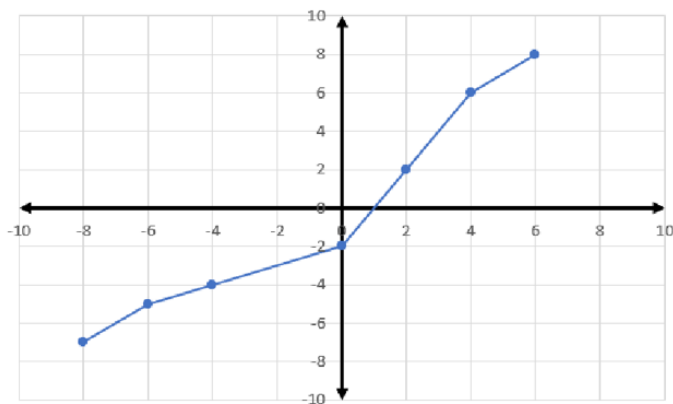
Name: _____

Problem Sheet

Use suggested strategies to answer the following 8 questions

Problem 1:

Consider the graph of $y = C(x)$ given below.



Identify the domain and range of the inverse function and evaluate $C^{-1}(-6)$.

- 1) Recall the definition of an inverse function.
- 2) Ask yourself:
 - a. How does the domain change for an inverse function?
 - b. How does the range change for an inverse function?
 - c. Which axis would you refer to find $C^{-1}(-6)$?
- 3) What is the domain and range of the inverse function?
- 4) What is $C^{-1}(-6)$?
- 5) Mark your answer in the answer sheet.

Problem 2:

In a certain experiment, the population, P , of a bacteria in thousands is given by $P = g(t)$ where t is the time in hours. Assume the function has an inverse. Interpret the statement: $g^{-1}(3) = 6$.

- 1) Underline the keywords: Independent variable? Dependent variable?
- 2) Recalling the definition and properties of an inverse function, ask yourself:
 - a. What does $g^{-1}(3) = 6$ represent?
 - b. What does the value 3 represent?
 - c. What does the value 6 represent?
- 3) Mark your answer in the answer sheet.

Problem 3:

A quadratic function with leading coefficient, a , goes through the points $(-3, 0)$, $(7, 0)$ and $(0, 6)$. Determine the value of a .

- 1) What do we know about the points $(-3, 0)$, $(7, 0)$, and $(0, 6)$?
- 2) Recall different forms of quadratic function:
 - a. Standard form: $y = ax^2 + bx + c$
 - b. Vertex form: $y = a(x - h)^2 + k$
 - c. Factored form: $y = a(x - x_1)(x - x_2)(x - x_3) \dots (x - x_n)$

Note you are expected to know these formulas for the exam!

- 3) Which form can we use given these three points?
- 4) Mark your answer in the answer sheet.

Problem 4:

Which of the following tabular relations is a one-to-one function?

- 1) Before looking at the choices, ask yourself:
 - a. What is the definition of a one-to-one function?
 - b. What do you expect the correct answer to look like?
- 2) Mark your answer in the answer sheet.

(A)

x	0	2	4	6	9
$f(x)$	3	4	6	8	3

(B)

x	-2	0	1	-2	-5
$f(x)$	3	5	8	10	14

(C)

x	3	2	1	0	-1
$f(x)$	9	4	1	0	1

(D)

x	2	1	0	1	2
$f(x)$	6	7	7	7	6

(E)

x	-3	-1	2	3	7
$f(x)$	6	4	1	-1	-3

Problem 5:

Determine the quadratic function with vertex (5, 10) and goes through the origin.

- 1) Recall what the origin and vertex mean; use that knowledge and vertex (5,10) to find the equation for a quadratic function.

You're provided with **a vertex and a point**. This question is the best candidate to use a vertex form of a quadratic function

- 2) Mark your answer in the answer sheet.

Problem 6:

Which one of these quadratic functions opens upward and has its vertex at $x = 6$?

- 1) Before looking at the choices, ask yourself:
 - a. When does a function open upwards? Eliminate all the choices that do not hold
 - b. What do we know about the equation $x = 6$ when the vertex occurs at this point? (Hint: we call this equation the Line of Symmetry)
- 2) Now:
 - a. **Either:** You can graph all the leftover choices and check which graph matches the line of symmetry (could be time-consuming)
 - b. **Or:** You can use the vertex form to evaluate values for a , b , and c and match the choices
- 3) Mark your answer in the answer sheet.

(A) $y = -2x^2 + 24x + 16$

(B) $y = 2x^2 + 24x + 16$

(C) $y = -2x^2 - 24x + 16$

(D) $y = 2x^2 - 24x + 16$

(E) $y = 2x^2 + 24x + 6$

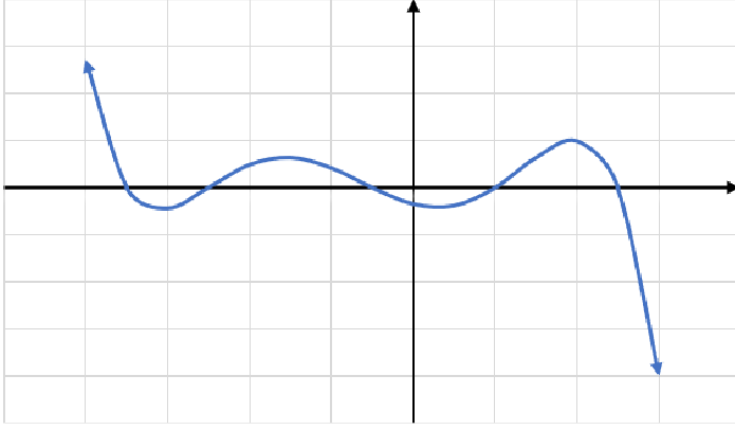
Problem 7:

Determine a formula for the inverse function for $y = f(x) = \frac{20x+2}{5+0.2x}$

- 1) Recall the steps to find the inverse:
 - i) Set $y = \frac{20x+2}{5+0.2x}$
 - ii) Solve for x
 - iii) Set $x = f^{-1}(y)$
 - iv) Swap x and y (swapping is okay here because y and x don't represent anything)
- 2) Mark your answer in the answer sheet.

Problem 8:

Which ONE of the following groups of statements is TRUE about the polynomial $y = f(x)$ whose graph is below?



- 1) A quick glance at the choices will tell you that you are required to find information about the polynomial in the graph
 - a. The highest degree (use end behavior)
 - b. The leading coefficient (use end behavior)
 - c. Constant term (use y -intercept)
- 2) What is the end behavior of the polynomial in the graph?
 - a. What does that tell you about the highest degree?
 - b. What does that tell you about the leading coefficient?
- 3) Is the y -intercept negative or positive?
 - a. What does this tell you about the constant term?
- 4) Mark your answer in the answer sheet