

BRONX COMMUNITY COLLEGE
of the City University of New York

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

MTH 30
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Exam 2 REVIEW
Fall 2023

Directions: REVIEW FOR TEST 2

1. Consider the function f given in the table below. *No work required on this problem.*

x	2	-4	6	-10	0	-17
$f(x)$	0	-6	-10	-2	6	1

Use the table to evaluate the following:

- a. $f(0)$
 - b. $f(-10)$
 - c. $f^{-1}(0)$
 - d. $f^{-1}(1)$
 - e. $f^{-1}(-2)$
2. Consider the graph of the equation $y = x^2 + 9x + 20$. Find all its intercepts (x and y intercepts).
3. Consider the graph of the equation $y = x^2 + x - 20$. Find all its intercepts (x and y intercepts).
4. Suppose $f(x) = -5x + 2$. Find the inverse $f^{-1}(x)$ using algebra.
5. For each pair of functions determine if they are inverses of each other by checking if $f(g(x)) = x$ and $g(f(x)) = x$.
- a. Check if the following two function are inverses: $f(x) = x + 4$ and $g(x) = x - 4$
 - b. Check if the following two function are inverses: $f(x) = x + 3$ and $g(x) = x + 3$
 - c. Check if the following two function are inverses: $f(x) = 7x$ and $g(x) = (1/7)x$

6. Consider the linear functions, $f(x) = 2x + 2$ and $g(x) = 2x - 3$ and $h(x) = -4x + 1$.
For each pair determine if they intersect or not. If they intersect, find the intersection point.
7. Solve each of the following equations (note that they use absolute values).
- Solve $|x| = 405$
 - Solve $|y - 10| = 405$
 - Solve $|y + 10| = 405$
 - Solve $|5y + 10| = 405$
 - Solve $5|y + 10| = 405$
 - Solve $5|5y + 10| = 405$
8. Solve each of the following inequalities (note that they use absolute values).
- Solve $|x| < 10$
 - Solve $|x| \geq 10$
 - Solve $|-2x| < 10$
 - Solve $-2|x| < 10$
 - Solve $-2|-2x| > 10$
 - Solve $-2|-2x| - 2 < 10$
 - Solve $-2|-2x| - 2 \geq 10$
9. For each of the two functions do this: a) Graph it, b) Find its domain and range, c) Is the function one-to-one, d) Does the function have an inverse, e) If the function has an inverse, find the domain and range of its inverse.
- $g(x) = 4x^8$
 - $h(x) = 4x^3$
 - $f(x) = 2 + \frac{1}{x - 3}$
10. Let $f(x) = (-4/3)x - 1$. Find the slope and all intercepts. Then graph the function.
11. Graph $f(x) = x^3$. Then do the following:
- Let $g(x) = (x + 2)^3 + 2$
Describe how the graph of g is a transformation of the graph of the original function f . Then graph g .
 - Let $h(x) = 4 - x^3$
Describe how the graph of h is a transformation of the graph of the original function f . Then graph h .

12. Consider the graph of the function $f(x) = -x^2 - 3x + 1$.
- Does $f(x)$ open up or open down?
 - Find the equation of its axis of symmetry.
 - Find the vertex.
 - What is the maximum and minimum value of $f(x)$? (if it does not have one of these, then state that)
 - Draw a rough graph of $f(x)$ (i.e., do not worry about intercepts, but label the vertex and get shape roughly correct).