

Math 111-W-20 TEST 2-O

1. Do the following relations represent functions? (why or why not?)

a) $f = \{(2, 1), (3, 2), (2, -2), (4, 7)\}$

b) $g = \{(1, 2), (2, 1), (2, -11), (3, 4), (6, 5)\}$

c) $h = \{(1, 1), (2, 2), (7, 3), (5, 6)\}$

2. Find $g(h(x))$ where g and h are given above:

3. Graph the following piece wise function, make sure to label the axes with an appropriate scale $f(x) = 3x + 1$ for $x \geq 3$ and $f(x) = x - 3$ for $x < 3$

4. From the following list of boldface phrases, circle all those that apply to describe the given problems.

A shift to the right (SR), A shift to the left (SL), A shift up (SU), A shift down (SD), A vertical expansion (VE), A vertical compression (VC), A horizontal expansion (HE), A horizontal compression (HC), A reflection (RX) in the x-axis (vertical).

a) $3f(x - 2) - 3$

SR SL SU SD VE VC HE HC RX

b) $-f(2x - \frac{2}{3})$

SR SL SU SD VE VC HE HC RX

c) $f(\frac{x}{4} + 2) - 6$

SR SL SU SD VE VC HE HC RX

d) $\frac{1}{3}f(x + 5) + 2$

SR SL SU SD VE VC HE HC RX

5. Find the inverse of the following functions:

a) $f(x) = \frac{7 - x}{4}$

b) $f(x) = \frac{2x + 1}{x - 3}$

6. Given that $f(x) = 2x^2 + x$, $g(x) = 5x - 7$, and $h(x) = \sqrt{x - 1}$, find the following (do not spend time on simplification):

a) $f(h(2)) =$

b) $f(2x) - (g(x))^2 =$

7. Determine if the following functions are even or odd or neither. **SHOW SOME KIND OF REASON OR WORK OR SOMETHING. ONE WORD ANSWERS ARE WRONG**

a) $f(x) = x^2 + x$

b) $f(x) = \frac{3}{x - 5}$

c) $f(x) = x^3 + 4x$

8. Find the vertex and all real zeros of the following parabola.

$$f(x) = -x^2 + 2x + 3$$

9. Find the max or min (value) of the following function. State if this is a max or a min and why.

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