

Final Exam Review Sheet

Chapter 0

1. Solve the following

$$|2x - 6| = 11$$

$$|x - 3| + |x - 4| = \frac{1}{2}$$

$$\frac{2x+1}{x-3} < 4$$

$$\left| \frac{5x-3}{x+2} \right| < 1$$

2. Write the following as a union of intervals

$$\{x : |x - 2| < \frac{1}{10}\}$$

$$\{x : |x - 5| \geq 3\}$$

$$\{t : |2t + 7| \geq 5\}$$

Chapter 1

3. Let

$$g(x) = \frac{x-1}{x+2}$$

- a) Find a number b such that $g(b) = 4$.

- b) Simplify the expression

$$\frac{g(a+t) - g(a)}{t}$$

4. Find the domain of each function

$$f(x) = \frac{2x+1}{3x-4}$$

$$f(x) = \frac{\sqrt{x-5}}{x-7}$$

$$f(x) = \sqrt{|x-6| - 1}$$

5. pg 81. #15-20.

6. Remember what it means to be even and odd functions. pg 82. #55-58. READ THE QUESTION CAREFULLY.

7. For each pair of functions $f(x), g(x)$ below, find $f \circ g(x)$ and $g \circ f(x)$

$$f(x) = x^2 + 1$$

$$g(x) = \frac{1}{x}$$

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

$$g(x) = x^2 + 2$$

$$f(x) = \frac{t-1}{t^2+1}$$

$$g(x) = \frac{t+3}{t+4}$$

8. Find a number b such that $f \circ g = g \circ f$ where $f(x) = 2x + b$ and $g(x) = 3x + 4$

9. Find the domain and range of f, f^{-1} for each of the following functions

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

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

$$f(t) = \frac{1+t}{2-t}$$

$$f(x) = 2 + \frac{x-5}{x+6}$$

10. Suppose $g(x) = x^7 + x^3$. Evaluate $(g^{-1}(4))^7 + (g^{-1}(4))^3 + 1$

11. pg 129. #6

Chapter 2

12. Find a number w such that the line containing $(1, w)$ and $(3, 7)$ has slope 5.

13. Find a number c such that $(c, 13)$ is on the line between $(-4, -17)$ and $(6, 33)$.

14. Find the equation of the line in the xy -plane that contains $(3, 2)$ and is parallel to $y = 4x - 1$.

15. Find a number t such that the line in the xy -plane containing $(t, 4)$ and $(2, -1)$ is perpendicular to $y = 6x - 7$.

16. pg 163 #29-31, 41

17. Factor $x^{16} - y^8$ as nicely as possible.

18. Find all real numbers x such that $x^4 + 5x^2 - 14 = 0$.

19. Find a polynomial of degree 3 such that $-2, -1, 4$ are zeros of p and $p(1) = 2$.

20. Find the vertex of the graph of $y = 5x^2 + 2x + 3$.

21. Find a number x such that $\frac{x+1}{x-2} = 3x$.

22. Simplify

$$\frac{(t^3 w^5)^{-3}}{(t^{-3} w^2)^4}$$

$$\left(\frac{(x^2 y^5)^{-4}}{(x^5 y^{-2})^{-3}} \right)^2$$