

Math 160 Exam #2 Review Sheet

Please Note: The exam will cover 4.1 to 5.5. The review sheet is designed for you to have a guide as to what to study. The problems on the exam are not limited to the type of problems on this sheet. Any type of problem from the assigned homework problems are possible exam questions. Please attempt other practice problems other than those presented on this sheet in order to be completely prepared for the exam.

1. Given the following functions. Determine the x -intercept(s), y -intercept, vertical asymptote(s), horizontal asymptote, table of values, and the graph.

a. $f(x) = \frac{3x-2}{x^2-4x+3}$

b. $f(x) = \frac{3x-4}{x-3}$

c. $f(x) = \frac{x^2-3x-4}{x+2}$

2. Find the horizontal or oblique asymptote of the following.

a. $y = \frac{3x+4}{9-5x}$

b. $y = \frac{4x^2-5x+2}{2x-3}$

3. Find the vertical asymptote(s) of the following.

a. $y = \frac{3x}{x^2+5x+6}$

b. $y = \frac{6x}{x^3-4x^2+4x}$

4. Solve the following inequalities.

a. $\frac{x^2-4x+3}{x+4} \geq 0$

b. $x^2+4x < 12$

c. $\frac{x+4}{x-2} \leq 1$

5. Find all real and complex zeros of the following polynomial equations.

a. $3x^3 - 5x^2 + 2x - 8 = 0$

b. $x^4 - 5x^3 + 3x^2 + 15x - 18 = 0$

c. $2x^3 + 3x^2 + 2x + 3 = 0$

d. $2x^3 - 11x^2 + 10x + 8 = 0$

e. $x^4 - 2x^3 + 10x^2 - 18x + 9 = 0$

f. $x^3 - 8x^2 + 25x - 26 = 0$

g. $2x^4 + x^3 - 35x^2 - 113x + 65 = 0$

6. Given the following functions are one-to-one. Find $f^{-1}(x)$.

a. $f(x) = x^5 + 2$

b. $f(x) = 4x - 3$

c. $f(x) = \frac{2}{x-3}$

d. $f(x) = \frac{1}{x}$

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

f. $g(x) = x^2 - 3$ on $[0, \infty)$

7. Graph the following functions.

a. $f(x) = 2^{x-1} + 4$

b. $f(x) = \log_2(x+3) - 4$

8. Solve for x :

a. $2^{2x+1} = 4$

b. $3^{x^3} = 9^x$

c. $3^x = 14$

d. $3^{1-2x} = 4^x$

e. $x = \log_5 625$

f. $\log_8 x = -2$

g. $\log_x 4 = \frac{1}{3}$

9. Given $f(x) = 3x + 5$ and $g(x) = x^2 - 1$. Determine the following.

a. $(f \circ g)(x)$

b. $(g \circ f)(x)$

10. Given $f(x) = \frac{x-3}{x+1}$ and $g(x) = \frac{x+2}{x-4}$. Determine the following.

a. Domain $(f \circ g)$

b. Domain $(g \circ f)$

11. Express the following as a sum and/or difference of logarithms.

a. $\log_3 \frac{x^4 y^3}{z^2 w^3}$

b. $\log \sqrt{\frac{x^2}{y^3}}$

12. Express the following sum and difference of logarithms as a single logarithm.

a. $2\log_3 x + 4\log_3 y - 6\log_3 z$

b. $6\log_4 x - 2\log_4 y + 3\log_4 z$