

HOMEWORK 7 - MATH 102

DUE DATE: Monday, April 2

INSTRUCTOR: George Voutsadakis

Read each problem **very carefully** before starting to solve it. Four out of the eight problems will be chosen at random and graded. Each problem graded is worth 3 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Find the values that make the following rational expressions undefined:

(a) $\frac{x+3}{x^2-x-12}$

(b) $\frac{x^2+4}{2x^2-11x-6}$

2. Write the given rational expression with the indicated denominator:

(a) $\frac{-7x}{x-y}$ with denominator $x^2 - y^2$

(b) $\frac{-3x}{x-6}$ with denominator $x^2 - 2x - 24$

3. Simplify each fraction and write it in the standard form:

(a) $\frac{x^2+7x-18}{x^2-3x+2}$

(b) $\frac{2-x}{x^2+5x-14}$

4. Perform the indicated operations and simplify:

(a) $\frac{x^2+9x+18}{5x+15} \cdot \frac{2x-4}{x^2+x-6}$

(b) $\frac{x^2-27}{x^2+3x+9} \cdot \frac{x^2+4x+16}{x^3-64}$

5. Perform the indicated operations and simplify:

(a) $\frac{x^3}{5x^2-45} \div \frac{x}{x+3}$

(b) $\frac{3x+12}{4x^2+4x} \div \frac{x^2+x-12}{x^2-1}$

6. Perform the indicated operations and simplify:

(a) $\frac{2x+7}{3(x+2)} + \frac{3x-15}{3x+6}$

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

7. Perform the indicated operations and simplify:

(a) $\frac{x+7y}{x-3y} - \frac{x+3y}{x-7y}$

(b) $\frac{8x}{x^2-4y^2} - \frac{2x}{x^2-5xy+6y^2}$

(c) $\frac{2}{5+x} + \frac{5x}{x^2-25} + \frac{7}{5-x}$

8. Perform the indicated operation and give the answer in simplified form:

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

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

(c) $\frac{\frac{8x}{3x+1} - \frac{3x-1}{x}}{\frac{x}{3x+1} - \frac{2x-2}{x}}$