

Instructions: This is a practice test. It is by no means comprehensive, as the test may include situations that practice test does not address. That being said, your **WeBWork** and especially the **final exam review** should give you a good idea of what to expect on your tests. You should write all answers in simplest rational form. That means **NO DECIMAL SOLUTIONS**. ***You will not be granted a calculator.**

1. [25] Basic Factoring

- $18x^2y^2 + 6xy^3 - 12x^2y^3$
- $100x^4y^{10} - 81t^6$
- $b^2 - 13ab - 48a^2$
- $15x^2 + 11x - 12$
- $12a - 15ab - 8b + 10b^2$

2. [10] Factoring Completely / Zero Product Property

- $5x^3 - 6x^2 = 8x$
- $x^4 - 5x^3 - 4x^2 + 20x = 0$

3. Polynomial Equations

- [10] Write a cubic expression of one variable with leading coefficient -2 with roots $0, -3, 5$. Expand and rewrite in standard form.
- [10] Consider the equation $x^3 + 3x^2 - 6x - 8 = 0$. It is known that $x = -1$ is a solution. Find the remaining solutions using long division and factoring.
- [10] Write down a polynomial of one variable, x , which when evaluated at each of $x = -2, x = 15$, and $x = 0$ would give 0 . Expand and rewrite in standard form.

4. [20] Multiplication / Division of Fractions

$$\frac{x^2 - 5x - 24}{4x^2 + 12x} \div \frac{64 - x^2}{6x^4}$$

5. [10] Addition / Subtraction of Fractions

$$\frac{c - 11}{c + 9} - \frac{6c - 15}{6c + 54}$$

6. [10] Rational Equations (*Show ALL extraneous solutions)

$$\frac{3x}{x-4} + \frac{2}{x-3} = \frac{12}{x^2 - 7x + 12}$$

7. [10] Complex Fractions

a.
$$\frac{3 - \frac{4x}{w}}{\frac{16x^2}{w^2} - 9}$$

b.
$$\frac{\frac{4}{t} - \frac{7}{t-5}}{\frac{4}{t-5} - \frac{7}{t}}$$

c.
$$\frac{\frac{3}{x} + \frac{12}{y}}{\frac{9}{x} - \frac{6}{y}}$$

8. [10] Division of Polynomials

$$\frac{x^3 + 3x^2 - 6x - 8}{x + 1}$$

9. [10] Linear Equations

- a. [5] Find an equation of the line that passes through $(-6, 3)$ and $(5, -2)$.
b. [5] $-(-x - 6) + 3(-2x + 2) = -(7x + 5)$

10. [10] System of Linear Equations

$$\begin{aligned} 2x + 7y &= 5 \\ 3x - 6y &= -42 \end{aligned}$$