



## MATH 150 - WEEK-IN-REVIEW 2

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### PROBLEM STATEMENTS

1. Rationalize the denominator.

(a)  $\frac{x - y}{\sqrt{x} - \sqrt{y}}$

(b)  $\frac{4\sqrt{6} + 3\sqrt{3}}{3\sqrt{6} - 4\sqrt{3}}$

2. Simplify the following expression.

$$\left(\frac{a^{5/4} \cdot a^{-3/8}}{a^{-3/4}}\right)^{2/3}$$



3. Factor each expression.

(a)  $4x^2y^2 - 12xy + 9$

(b)  $10y^2 - 3y - 1$

(c)  $(x - 1)(x^2 + 3) + (x - 1)(x^2 - 5)$

(d)  $(x + 2)^3(x^2 + 7)^2 - x(x + 2)^4(x^2 + 7)$



4. Find the domain of each expression.

(a)  $\frac{3x + 2}{5x^2 - 10}$

(b)  $\frac{\sqrt{x - 5}}{x^2 - 8x}$

5. Perform the operations and simplify.

(a)  $\frac{x^2 - 1}{32x^2 - 32} \cdot \frac{2x^2 - 2x - 4}{2x^2 + 3x + 1}$

(b)  $\frac{x^2 - 3x - 10}{2x^2 - 9x - 5} \div \frac{x^2 - 2x - 8}{2x^2 - 9x + 4}$



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

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

6. Consider the complex numbers  $z_1 = 4 + \sqrt{-18}$  and  $z_2 = 2 + \sqrt{-50}$ .

(a) Write  $z_1$  and  $z_2$  in standard form.

(b) Find  $z_1 + z_2$ ,  $z_1 - z_2$ , and  $z_1 z_2$ .



(c) Find the complex conjugate of  $z_2$ .

(d) Find  $z_1 \div z_2$ .

7. Solve the equation by using the quadratic formula.  $4x^2 = 4x - 3$

8. Solve the equation  $3x^2 + 2x - 3 = 0$  by completing the square.



9. Solve the polynomial equations.

(a)  $4x^4 - 28x^2 = 0$

(b)  $5x^3 + 30x^2 + 25x = 0$



(c)  $x^3 - 3x^2 - x = -3$

10. Solve the equation  $\frac{7}{2x+1} - \frac{8x}{2x-1} = -4$  and check your solution(s).