Math 150 - Week-In-Review 1

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Problem Statements

1. Find the domain of each expression.
   (a) $\dfrac{7x+1}{9x^2-3}$

   (b) $\dfrac{\sqrt{1-2x}}{x^2-5x}$

2. Perform the operations and simplify.
   (a) $\dfrac{2x^2-5x-3}{6x^2+3x} \cdot \dfrac{3x^2+12x-15}{x^2+2x-15}$

(b) $\dfrac{x^2+5x-14}{x^2+8x+7} \div \dfrac{x^2-x-2}{x-3}$

(c) $\dfrac{x+1}{x^2-2x-8} - \dfrac{x-3}{x^2-4}$

(d) $\dfrac{\dfrac{1}{x} - \dfrac{1}{2x^2}}{\dfrac{2}{x} - 1}$

3. Consider the complex numbers $z_1 = 1 + \sqrt{-27}$ and $z_2 = 2 - \sqrt{-12}$.
   (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_1.

   (d) Find $z_2 \div z_1$.

4. Solve the equation by using the quadratic formula. $x^2 = 5 - 2x$

5. Solve the equation $5x^2 + 2x - 1 = 0$ by completing the square.

6. Solve the polynomial equations.
   (a) $4x^4 - 16x^2 = 0$

   (b) $7x^3 - 42x^2 - 49x = 0$

   (c) $2x^3 - 6x^2 - 3x = -9$

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

8. Solve the equation $\sqrt{x+5} - 1 = x + 4$ and check your solution(s).