Algebra II 9.4 - 9.6 Review Problems Name Key

Perform the indicated operation and simplify if possible.

1. $\frac{12x^8y}{5y^5} \div \frac{3y^2}{x^2}$

R: $x \neq 0$, $y \neq 0$

$\frac{12x^8y}{5y^5} \cdot \frac{x^2}{3y^2} = \frac{12x^{10}y}{15y^7}$

$= \boxed{\frac{4x^{10}}{5y^6}}$

2. $\frac{\frac{6x^2+x-1}{4x^3+4x^2}}{\frac{6x^2-2x}{x^2-4x-5}}$ $\quad \frac{6x^2+x-1}{4x^3+4x^2} \div \frac{6x^2-2x}{x^2-4x-5}$

$\frac{(3x-1)(2x+1)}{4x^2(x+1)} \cdot \frac{(x-5)(x+1)}{2x(3x-1)}$

$\boxed{\frac{(2x+1)(x-5)}{4x^2}}$ $\quad x \neq 0, -1, \frac{1}{3}, 5$

3. $\frac{2x^2-x-6}{2x^2+5x+3} \cdot \frac{x^2+x}{x^2-4}$

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

$\boxed{\frac{x}{x+2}}$ $\quad x \neq -3/2, -1, \pm 2$

4. $\frac{a^2-b^2}{6b} \div \frac{a+b}{36b^2}$

$\frac{(a+b)(a-b)}{6b} \times \frac{36b^2}{a+b}$ (6b)

$= \boxed{6b(a-b)}$

R: $b \neq 0$, $a \neq -b$

5. $\frac{x^2-x-20}{4x+4} \div \frac{x+4}{x^2-1}$

$\frac{(x-5)(x+4)}{4(x+1)} \cdot \frac{(x+1)(x-1)}{x+4}$

R: $x \neq \pm 1, -4$

$\boxed{\frac{(x-5)(x-1)}{4}}$

6. $\frac{x+2}{x-5} + \frac{6}{1}$ LCD: $x-5$

$\frac{x-2}{x-5} + \frac{6(x-5)}{x-5}$

$\frac{x-2+6x-30}{x-5} = \frac{7x-32}{x-5}$

$\boxed{= \frac{7(x-4)}{x-5}}$

LCD: $12w^2y^2$

7. $\frac{4}{6w^2y} - \frac{2y}{4wy^2}$

$\frac{4\cdot 2y}{6w^2y\cdot 2y} + \frac{-2y\cdot 3w}{4wy^2\cdot 3w}$

$\frac{8y}{12w^2y^2} + \frac{-6wy}{12w^2y^2} = \frac{8y-6wy}{12w^2y^2} = \frac{2y(4-3w)}{12w^2y^2} = \boxed{\frac{4-3w}{6w^2y}}$

LCD: $(x+6)(x-2)$

8. $\frac{x+5}{x+6}\frac{(x-2)}{(x-2)} + \frac{1}{x-2}\frac{(x+6)}{(x+6)}$

$\frac{x^2+3x-10}{(x+5)(x-2)} + \frac{x+6}{(x+6)(x-2)}$

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

9. $\frac{5}{3m+1} - \frac{3m-1}{9m^2-1}$

LCD: $(3m+1)(3m-1)$

$\frac{5(3m-1)}{(3m+1)(3m-1)} + \frac{-3m+1}{(3m+1)(3m-1)}$

$\frac{15m-5}{(3m+1)(3m-1)} + \frac{-3m+1}{(3m+1)(3m-1)}$

$\frac{12m-4}{(3m+1)(3m-1)} = \frac{4(3m-1)}{(3m+1)(3m-1)} = \boxed{\frac{4}{3m+1}}$

10. $\frac{x+2}{2x-2} - \frac{-2x-1}{x^2-4x+3}$

LCD: $2(x-3)(x-1)$

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

$\frac{x^2-x-6}{2(x-3)(x-1)} + \frac{4x+2}{2(x-3)(x-1)}$

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

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

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

11. $\frac{\frac{3}{x^2-4}}{\frac{2}{x+2} - \frac{x+1}{x^2-x-6}}$

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

$\frac{2x-6+-x-1}{(x-3)(x+2)} = \frac{x-7}{(x-3)(x+2)}$

$\frac{3}{(x+2)(x-2)} \div \frac{x-7}{(x-3)(x+2)}$

$\frac{3}{(x+2)(x-2)} \cdot \frac{(x-3)(x+2)}{x-7} = \boxed{\frac{3(x-3)}{(x-2)(x-7)}}$