Xavier University of Louisiana

Study Guide for the Xavier Mathematics Placement Test

5. Operations on and simplification of rational expressions

Practice Problems

Reduce to lowest terms:

1. $\dfrac{36x^5y^4z^3}{18x^5y^2z^6} = \boxed{\dfrac{2y^2}{z^3}}$

2. $\dfrac{5\left(x^2-9\right)}{10\left(x+3\right)} = \boxed{\dfrac{x-3}{2}}$

3. $\dfrac{6\left(x^2+2x+1\right)}{27\left(x^2-x-2\right)} = \boxed{\dfrac{2\left(x+1\right)}{9\left(x-2\right)}}$

Perform the operations and simplify the result:

1. $\dfrac{3\left(x^2-9\right)}{x-1} \cdot \dfrac{x^2-x}{9\left(x^2-6x+9\right)} = \boxed{\dfrac{x\left(x+3\right)}{3\left(x-3\right)}}$

2. $\dfrac{4\left(x^2-16\right)}{x+5} \div \dfrac{2\left(x^2+8x+16\right)}{x^2+5x} = \boxed{\dfrac{2x\left(x-4\right)}{x+4}}$

3. $\dfrac{x+4}{x-2} - \dfrac{x}{x+4} = \boxed{\dfrac{2\left(5x+8\right)}{\left(x+4\right)\left(x-2\right)}}$

4. $\dfrac{\dfrac{4}{x-5} - \dfrac{4}{x+5}}{\dfrac{4}{x-5} + \dfrac{4}{x+5}} = \boxed{\dfrac{5}{x}}$

5. $\left(\dfrac{\left(x^4y^2\right)^2}{x^4y}\right)^3 = \boxed{x^{12}y^9}$