

NC Math 3 Honors - Unit 5: Rational Functions Homework

5.2 Multiplying and Dividing Rational Expressions

Perform the indicated operation. Make sure your answer is in simplest form.

$$1. \frac{-ab^4}{c^5d^8} \cdot \frac{-c^7d^3}{a^6b^9} = \frac{ab^4c^7d^3}{a^6b^9c^5d^8}$$

$$\boxed{\frac{c^2}{a^5b^5d^5}}$$

$$2. \frac{7x+7}{21x} \div \frac{x^2-1}{3x}$$

$$\frac{7(x+1)}{21x} \cdot \frac{3x}{(x+1)(x-1)}$$

$$\frac{21x(x+1)}{21x(x+1)(x-1)} = \boxed{\frac{1}{x-1}}$$

$$3. (x-5) \cdot \frac{3x+2}{5-x}$$

$$x-5 \cdot \frac{3x+2}{-(x-5)} = -(3x+2)$$

$$\boxed{-3x-2}$$

$$4. \frac{4x^2-9}{x^2-10x+25} \div \frac{2x-3}{x-5}$$

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

$$\boxed{\frac{2x+3}{x-5}}$$

$$5. \frac{x^2+x-6}{x^2+3x-4} \cdot \frac{x^2-6x+5}{x^2-2x-15}$$

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

$$\boxed{\frac{x-2}{x+4}}$$

$$6. \frac{x+3}{x-1} \div \frac{x-5}{x-1}$$

$$\frac{x+3}{x-1} \cdot \frac{x-1}{x-5} = \boxed{\frac{x+3}{x-5}}$$

$$7. \frac{x(a-b)+y(a-b)}{ax-bx+ay-by} \cdot \frac{x(a+7)+2(a+7)}{ax+7x+2a+14}$$

$$\frac{x(a-b)+2(a-b)}{ax-bx+2a-2b} \cdot \frac{x(a+7)-3(a+7)}{ax+7x-3a-21}$$

$$\frac{(a-b)(x+y)}{(a+7)(x-3)} \cdot \frac{(a+7)(x+2)}{(x+2)(a-b)}$$

$$\boxed{\frac{x+y}{x-3}}$$

$$8. \frac{x^2-1}{x+6} \div \frac{x-1}{3x+18}$$

$$\frac{(x+1)(x-1)}{(x+6)} \cdot \frac{3(x+6)}{(x-1)}$$

$$\boxed{3(x+1)}$$