Activity 1.4.1: Multiplication and Division of Rational Algebraic Expressions

Total points = 33

A. Solutions

1. $\frac{12mn^2}{6xy^2} \cdot \frac{9x^2y^2}{4m^2n^2}$ ✓
$= \frac{9x}{2m}$ ✓

2. $\frac{x^2-y^2}{2xy} \cdot \frac{y^2}{x+y}$ ✓
$= \frac{(x-y)(x+y)}{2xy} \cdot \frac{y^2}{x+y}$ ✓
$= \frac{y(x-y)}{2x}$ ✓

3. $\frac{x^2-2x}{x^2-3x-10} \cdot \frac{x^2-4x-5}{x^2-4}$ ✓
$= \frac{x(x-2)}{(x-5)(x+2)} \cdot \frac{(x-5)(x+1)}{(x-2)(x+2)}$ ✓
$= \frac{x(x+1)}{(x+2)^2}$ ✓

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

5. $\frac{a^2+2ab+b^2}{a^2-b^2} \cdot \frac{a-b}{a+b}$ ✓
$= \frac{(a+b)(a+b)}{(a-b)(a+b)} \cdot \frac{a-b}{a+b}$ ✓
$= 1$ ✓

B. Solutions

1. $\frac{14x^2}{20y^2} \div \frac{56x^2}{y}$ ✓
$= \frac{14x^2}{20y^2} \cdot \frac{y}{56x^2}$ ✓
$= \frac{1}{80y}$ ✓

2. $\frac{4a-4b}{30a^2} \div \frac{a-b}{9a}$ ✓
$= \frac{4a-4b}{30a^2} \cdot \frac{9a}{a-b}$ ✓
$= \frac{4(a-b)}{30a^2} \cdot \frac{9a}{a-b}$ ✓
$= \frac{6}{5a}$ ✓

3. $\frac{x^2-4}{x^2+4x+4} \div \frac{x^2-x-2}{x^2+3x+2}$ ✓
$= \frac{x^2-4}{x^2+4x+4} \cdot \frac{x^2+3x+2}{x^2-x-2}$ ✓
$= \frac{(x-2)(x+2)}{(x+2)(x+2)} \cdot \frac{(x+1)(x+2)}{(x-2)(x+1)}$ ✓
$= 1$ ✓

4. $\frac{x^2-2x-3}{x^2-3x} \div \frac{x^2-4}{x^2+2x}$ ✓
$= \frac{x^2-2x-3}{x^2-3x} \cdot \frac{x^2+2x}{x^2-4}$ ✓
$= \frac{(x-3)(x+1)}{x(x-3)} \cdot \frac{x(x+2)}{(x-2)(x+2)}$ ✓
$= \frac{x+1}{x-2}$ ✓

5. $\frac{x^2-4}{x^2+2x} \div \frac{x^2+x-6}{2x+4}$ ✓
$= \frac{x^2-4}{x^2+2x} \cdot \frac{2x+4}{x^2+x-6}$ ✓
$= \frac{(x-2)(x+2)}{x(x+2)} \cdot \frac{2(x+2)}{(x-2)(x+3)}$ ✓
$= \frac{2(x+2)}{x(x+3)}$ ✓

Typeset by Jonathan Rufo Bacolod using LaTeX

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

4. $\frac{x^2-2x-3}{x^2-3x} \div \frac{x^2-4}{x^2+2x}$ ✓
$= \frac{x^2-2x-3}{x^2-3x} \cdot \frac{x^2+2x}{x^2-4}$ ✓
$= \frac{(x-3)(x+1)}{x(x-3)} \cdot \frac{x(x+2)}{(x-2)(x+2)}$ ✓
$= \frac{x+1}{x-2}$ ✓

5. $\frac{x^2-4}{x^2+2x} \div \frac{x^2+x-6}{2x+4}$ ✓
$= \frac{x^2-4}{x^2+2x} \cdot \frac{2x+4}{x^2+x-6}$ ✓
$= \frac{(x-2)(x+2)}{x(x+2)} \cdot \frac{2(x+2)}{(x-2)(x+3)}$ ✓
$= \frac{2(x+2)}{x(x+3)}$ ✓