Simplify, Multiply & Divide Rational Expressions

$$\frac{2x+2}{x^2+4x+3} = \frac{2(x+1)^1}{(x+3)(x+1)_1} = \frac{2}{x+3}$$

$x^2+1x+3x+3$

$$\frac{x+4}{x^2-16} = \frac{(x+4)^1}{(x+4)(x-4)} = \frac{1}{x-4}$$

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

$$\frac{2x^2+4x}{x^2-4x-12} \cdot \frac{x^2-9x+18}{2x} = \frac{2x(x+2)}{(x-6)(x+2)} \cdot \frac{(x-6)(x-3)}{2x}$$

$$= x-3$$

DIVIDING RATIONAL EXPRESSIONS

To divide one rational expression by another, multiply the first expression by the reciprocal of the second expression.

$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c} =$ ____ ← Simplify $\frac{ad}{bc}$ if possible.

$$\frac{3}{x+7} \div \frac{8x^2-8x}{x^2+6x-7} = \frac{3}{x+7} \cdot \frac{x^2+6x-7}{8x^2-8x}$$

$$= \frac{3}{x+7} \cdot \frac{(x+7)(x-1)}{8x(x-1)}$$

$$= \frac{3}{8x}$$

Algebra 2 Name_____

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Date_____ Period____

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Simplify each and state the excluded values.

1) $\frac{63x^3}{21x^2}$ $= \frac{63}{21} \cdot \frac{x^3}{x^2} x = 3x$

11) $\frac{v-6}{10v-60}$ $= \frac{v-6}{10(v-6)} = \frac{1}{10}$

21) $\frac{x^2-16x+63}{x^2-15x+54}$ $= \frac{(x-9)(x-7)}{(x-9)(x-6)} = \frac{x-7}{x-6}$

40) $\frac{10v^5}{4} \div \frac{9v^4}{5}$ $\frac{10v^5}{24} \cdot \frac{5}{9v^4} = \frac{25v}{18}$

58) $\frac{x^2+9x+20}{40x+64} \div \frac{x^2+9x+20}{25x+40}$ $= \frac{x^2+9x+20}{40x+64} \cdot \frac{25x+40}{x^2+9x+20}$

$\frac{5(5x+8)}{8(5x+8)} = \frac{5}{8}$