

## Fifteenth Set of Homework

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Due: Tuesday March 22

**Please note:** You should fully justify your answers.

### Multiplication and Division of Rational Expressions

1. Perform the indicated operations. Simplify your answers as much as possible.

(a)  $\frac{10y^2}{5x^2} \cdot \frac{15x^3}{2y^4}$

(b)  $\frac{18mn^3}{16m^2n^2} \div \frac{8mn^3}{9m^2n}$

(c)  $\frac{5x^2y^5}{7xy} \cdot \frac{21x^3}{10y^4} \div \frac{3x^3y^2}{2x^5y^3}$

(d)  $24x^4y^3 \cdot \frac{5x^2}{8x^3y^5}$

(e)  $\frac{2a^4b^3}{\frac{c^3}{a^5b^2c}} \cdot \frac{abc^4}{1}$

(f)  $(3a + 3b) \div \frac{3}{a + b}$

(g)  $(2x - 5) \cdot \frac{x^2 + 1}{4x - 10}$

(h)  $\frac{x^3 + 2x^2}{x^2 - 4x + 4} \cdot \frac{x^2 + 13x + 22}{3x^2 + 5x - 2}$

(i)  $\frac{27t^3 + 8}{9t^3 - 6t^2 + 4t} \cdot \frac{t^2 - t}{3t^2 - t - 2}$

(j)  $\frac{x^2 - 5x - 24}{-x^2 - x + 30} \cdot \frac{x^2 - 7x + 10}{x^2 - 15x + 56}$

(k)  $\frac{x^4 - 81}{x^2 - x - 20} \div \frac{x^2 - x - 6}{3x - x^2 + 10}$

(l)  $\frac{x + 3}{4x^2 - 12x + 9} \div (3x^2 + 11x + 6)$

(m)  $\frac{ac + ad + bc + bd}{ac + ad - bc - bd} \cdot \frac{a^2 - b^2}{1}$

(n)  $\frac{x^2 - 6xy + 9y^2}{x^2 - 4y^2} \cdot \frac{x^2 - 5xy + 6y^2}{(x - 3y)^2} \div \frac{x^2 - 9y^2}{x^2 - xy - 6y^2}$

(o)  $\frac{1}{\frac{x^2 - 16}{1}}$

(p)  $\frac{(x - 4)^2}{a^3 - a^2b}$

(p)  $\frac{ac - a}{\left(\frac{a - b}{c - 1}\right)^2}$