Name: _____   Date: _____

2.2 Skills You Need: Operations With Rational Expressions   **BLM 2–4**

1. Simplify and state the restrictions on the variable.

a) $\dfrac{2x^3}{3x^2-4x} \times \dfrac{6x-8}{2x-2}$

b) $\dfrac{2x^2-3x}{x^2} \times \dfrac{x^2-3x-4}{2x^2-x-3}$

c) $\dfrac{2x^2-13x+20}{x} \times \dfrac{x^2+4x-5}{x^2-5x+4}$

d) $\dfrac{x^2-1}{x^2-4} \times \dfrac{x^2-3x+4}{x^2+5x+4}$

2. Simplify and state the restrictions on the variable.

a) $\dfrac{x^2-4}{x+3} \div \dfrac{x^2-x-6}{x^2+x-6}$

b) $\dfrac{x^2+2x-8}{x^2+x-6} \div \dfrac{x^2+3x-4}{x^2-9}$

c) $\dfrac{x^2+x}{3x^2-14x+8} \div \dfrac{x^2+3x}{3x^2-10x-8}$

d) $\dfrac{x^3+4x^2+3x}{2x^2-5x-12} \div \dfrac{x^2+3x}{2x^2+9x+9}$

3. Simplify and state the restrictions on the variable.

a) $\dfrac{4}{x^2-x-6} + \dfrac{2}{x^2-2x-3}$

b) $\dfrac{2x}{x^2+x-12} - \dfrac{x}{x^2-9}$

c) $\dfrac{3x-1}{2x^2-7x-4} + \dfrac{2x-3}{2x^2+3x+1}$

d) $\dfrac{2x-1}{x^2+3x+2} - \dfrac{2x+2}{x^2+5x+6}$

4. Remove a common factor of –1 from one of the denominators and then simplify the expressions. Be sure to state any restrictions for the variable.

a) $\dfrac{4}{2x-1} + \dfrac{2}{1-2x}$

b) $\dfrac{3x}{x-7} - \dfrac{x}{7-x}$

c) $\dfrac{6x-1}{3x-4} + \dfrac{4x-1}{4-3x}$

d) $\dfrac{5x+2}{5x-2} - \dfrac{3x}{2-5x}$

5. A box with no lid is created from a square of cardboard with a side length of 60 cm by cutting rectangles of length x by $2x$ from each corner (the extra side length of this square of $2x$ is folded over to create a double thickness side for added strength).

a) Express the length, width, and height in terms of the variable x.

b) Find the expression for the volume of the box in terms of x.

c) Find the expression for the surface area of the box in terms of x.

d) What are the restrictions on the variable? Explain.

6. What, if any, is the difference between the expressions $\dfrac{x^2+5x+6}{x+3}$ and $\dfrac{2x^2+3x-2}{2x-1}$ when they are simplified?

7. Joe is travelling west on a road at 80 km/h. Jimmy is 10 min behind Joe, travelling at v km/h, and catches up to Joe after t hours.

a) Determine the expression for the distance each travels before Jimmy catches up.

b) Express Jimmy's speed in terms of t.

c) How fast would Jimmy need to travel if he needed to catch up to Joe in half an hour?