Simplify each **WITHOUT A CALCULATOR**. Leave answer as an improper fraction in reduced form. **Show your work.**

1. $\dfrac{18}{12} \cdot \dfrac{24}{27}$

2. $\dfrac{15}{18} \div \dfrac{35}{36}$

3. $\dfrac{7}{12} + \dfrac{11}{16}$

4. Find the EXACT solution. If answer is a fraction give your answer as an improper fraction in reduced form. **Show your work.**

$$\dfrac{7}{8} + \dfrac{11x}{24} - \dfrac{x}{12} = \dfrac{1}{6}$$

$$x =$$

5. Solve for Q. State restrictions on the variables.

$$\dfrac{RQ - K}{M} = E$$

$$Q =$$

Restrictions:

6. Simplify each rational expression by factoring both numerator and denominator and canceling common factors. State restrictions on the variable. **Show your work.** Circle your answers and the restrictions.

a) $\dfrac{24x^2 - 12x}{2x^2 + 7x - 4}$

b) $\dfrac{10x^2 - 20x - 150}{8x^3 - 72x}$

c) $\dfrac{x^3 - x^2 - 12x}{6x^4 + 18x^3 - 96x^2 - 288x}$