Name _____ Date _____

# Practice 4.1: Rational Functions

**1.** Find the Domain of the following functions.

**a.** $f(x) = x^2 + 7x - 11$

**b.** $g(x) = \dfrac{3x}{x-8}$

**c.** $h(x) = \sqrt{x+4}$

**d.** $j(x) = \dfrac{\sqrt{x-2}}{x^2 - 3x - 28}$

**2.** Simplify.

**a.** $\dfrac{12}{15}$

**b.** $\dfrac{6+12}{6}$

**c.** $\dfrac{24x^2}{15x}$

**d.** $\dfrac{4x^5}{30x^2}$

**e.** $\dfrac{6xy}{xy-x}$

**f.** $\dfrac{2x-2}{5x^2-5x}$

**g.** $\dfrac{x^2-4}{x+2}$

**h.** $\dfrac{x^2-9}{3-x}$

**i.** $\dfrac{x^2-4x-21}{x^2-10x+21}$

**j.** $\dfrac{x^2+8x+16}{x^2-16}$

**k.** $\dfrac{x^2-100}{x^2+15x+50}$

**l.** $\dfrac{x^2+x-30}{x^2-7x-30}$

**m.** $\dfrac{x^2-2x-35}{x^3+5x^2+3x+15}$

**n.** $\dfrac{x^3+6x^2-4x-24}{x^2+8x+12}$

**3.** Perform the operation and simplify.

**a.** $\dfrac{7}{x+1} \bullet \dfrac{x+1}{21(x+2)}$

**b.** $\dfrac{x^2}{x+1} \bullet \dfrac{x^2-1}{x}$

**c.** $\dfrac{5x^2-15x}{25x+25} \bullet \dfrac{15}{x-3}$

**d.** $\dfrac{x^2-15x+56}{x^2-49} \bullet \dfrac{x^2+14x+49}{x^2-x-56}$

**e.** $\dfrac{x^2-11x+18}{x^2+3x-10} \bullet \dfrac{x^2+14x+45}{x^3-81x}$

**f.** $\dfrac{x^2-4x}{x+3} \bullet \dfrac{x^2+6x+9}{x^2-2x-8} \bullet \dfrac{x^2-x-6}{x^3+3x^2}$

**g.** $\dfrac{x+2}{5x-15} \div \dfrac{x-2}{5(x-3)}$

**h.** $\dfrac{x^2-16}{x-6} \div \dfrac{x-4}{x^2-2x-24}$

**i.** $\dfrac{x^3-x}{x-1} \div \dfrac{(x+1)^2}{x^2-2x+1}$

**j.** $\dfrac{x^2-6x}{x^2-36} \bullet \dfrac{x^2-8x+12}{x^2-4x-12} \div \dfrac{x^2+4x-12}{x^2+8x+12}$

**k.** $\dfrac{\dfrac{x^2}{(x+1)^2}}{\dfrac{x}{(x+1)^3}}$

**l.** $\dfrac{\dfrac{x^2-9}{x^3}}{\dfrac{(x-3)^2}{3x}}$