

AA PREP—INTRODUCTION TO RATIONALS—WORKSHEET #1

KEY

1. Simplify each rational expression.

a) $\frac{x}{x} = 1$	b) $\frac{6 \cdot 7 \cdot 8 \cdot 9}{5 \cdot 6 \cdot 7 \cdot 8} = \frac{9}{5}$ or $\frac{4}{5}$
c) $\frac{x+5}{5+x} = \frac{\cancel{x+5}}{\cancel{x+5}} = 1$	d) $\frac{4-x}{x-4} = \frac{-x+4}{x-4} = -\frac{\cancel{x-4}}{\cancel{x-4}} = -1$
e) $\frac{5x+10}{20} = \frac{5(x+2)}{20} = \frac{x+2}{4}$	f) $\frac{x^2-2x-24}{x^2-16} = \frac{(x-6)\cancel{(x+4)}}{(x-4)\cancel{(x+4)}} = \frac{x-6}{x-4}$

2. Perform each operation (multiplication or division). Simplify.

a) $\frac{20}{21} \cdot \frac{49}{100} = \frac{7}{15}$	b) $\frac{24}{35} \div \frac{60}{63} = \frac{24}{35} \cdot \frac{63}{60} = \frac{18}{25}$
c) $\frac{x+5}{9-x} \cdot \frac{x-9}{5+x} = \frac{x+5}{-x+9} \cdot \frac{x-9}{x+5} = \frac{\cancel{x+5}}{\cancel{x-9}} \cdot \frac{\cancel{x-9}}{\cancel{x+5}} = -1$	d) $\frac{x^2-2x-15}{x^2-25} \div \frac{x^2-9}{x^2+6x+9} = \frac{x^2-2x-15}{x^2-25} \cdot \frac{x^2+6x+9}{x^2-9} = \frac{(x-5)\cancel{(x+3)}}{(x-5)\cancel{(x+5)}} \cdot \frac{(x+3)\cancel{(x+3)}}{\cancel{(x+3)}(x-3)} = \frac{(x+3)(x+3)}{(x+5)(x-3)} = \frac{x^2+6x+9}{x^2+2x-15}$

3. Perform each operation (addition or subtraction). Simplify.

a) $\frac{5}{11} - \frac{3}{11} = \frac{2}{11}$	b) $\frac{3}{8} \cdot \frac{1}{6} + \frac{5}{4} \cdot \frac{4}{4} = \frac{3}{24} + \frac{20}{24} = \frac{23}{24}$
c) $\frac{7}{x+12} - \frac{4}{x+12} = \frac{3}{x+12}$	d) $\frac{2x}{x^2-x-20} + \frac{4}{x-5} \cdot \frac{(x+4)}{(x+4)} = \frac{2x}{(x-5)(x+4)} + \frac{4(x+4)}{(x-5)(x+4)} = \frac{2x+4x+16}{(x-5)(x+4)} = \frac{6x+16}{(x-5)(x+4)} = \frac{2(3x+8)}{(x-5)(x+4)}$