Transitions to College Mathematics
2.3 Review

Name Key
Date: _____ Period: ____

***SHOW ALL WORK!***

**1.** Which of the following are expressions?

**A.** $3x+2$ **B.** $\dfrac{2x^2-4}{10}$ **C.** $2x-7y=32$

**Simplify AND give the restrictions.**

**2.** $\dfrac{-3x^2+20x+7}{2x^2-11x-21}$

$\dfrac{-(3x^2-20x-7)}{(2x+3)(x-7)}$

$\dfrac{-(3x+1)(x-7)}{(2x+3)(x-7)} = \boxed{\dfrac{-(3x+1)}{2x+3}}$

Domain: All Real #'s except $x=7, -\frac{3}{2}$

**3.** $\dfrac{2x^2-5x-12}{2x^2+5x+3} \rightarrow \dfrac{(2x+3)(x-4)}{(2x+3)(x+1)}$

$\boxed{\dfrac{x-4}{x+1}}$

Domain: All Real #'s except $x=-1, -\frac{3}{2}$

**Perform the indication operation(s) and simplify completely.**

**4.** $\dfrac{4-x^2}{x^2+2x-8} \cdot \dfrac{x^2-11x+28}{x^2-5x-14}$

$\dfrac{-(x+2)(x-2)}{(x-2)(x+4)} \cdot \dfrac{(x-7)(x-4)}{(x-7)(x+2)}$

$\boxed{\dfrac{-(x-4)}{x+4}}$

**5.** $\dfrac{z^2-81}{z^2-16} \div \dfrac{z^2-z-20}{z^2+5z-36}$

$\dfrac{z^2-81}{z^2-16} \cdot \dfrac{z^2+5z-36}{z^2-z-20}$

$\dfrac{(z+9)(z-9)}{(z+4)(z-4)} \cdot \dfrac{(z+9)(z-4)}{(z-5)(z+4)}$

$\boxed{\dfrac{(z+9)^2(z-9)}{(z+4)^2(z-5)}}$

**Perform the indication operation(s) and simplify completely.**

**6.** $\dfrac{2}{x-2}+\dfrac{x}{-x+2}$ $\cdot \frac{-1}{-1}$

$\dfrac{2}{x-2}+\dfrac{-x}{x-2}$

$\dfrac{2-x}{x-2}$

$\dfrac{-(x-2)}{x-2}$

$\boxed{-1}$

**7.** $\frac{x+5}{x+5}\cdot\dfrac{2x+1}{x-3}+\dfrac{x+2}{x+5}\cdot\dfrac{x-3}{x-3}$

$\dfrac{2x^2+x+10x+5}{(x+5)(x-3)}+\dfrac{x^2+2x-3x-6}{(x+5)(x-3)}$

$\boxed{\dfrac{3x^2+10x-1}{(x+5)(x-3)}}$

**8.** $\dfrac{2+\frac{1}{x}}{4x-\frac{1}{x}}$

Method 1: $\frac{x}{x}\cdot\frac{2}{1}+\frac{1}{x} \div \frac{x}{x}\cdot\frac{4x}{1}-\frac{1}{x}$

$\dfrac{2x+1}{x} \div \dfrac{4x^2-1}{x}$

$\dfrac{2x+1}{x}\cdot\dfrac{x}{4x^2-1}$

$\dfrac{\cancel{2x+1}}{\cancel{x}}\cdot\dfrac{\cancel{x}}{\cancel{(2x+1)}(2x-1)}$

$\boxed{\dfrac{1}{2x-1}}$

Method 2:

$\dfrac{2+\frac{1}{x}}{4x-\frac{1}{x}}\cdot\dfrac{x}{x}$

$\dfrac{2x+1}{4x^2-1}$

$\dfrac{\cancel{2x+1}}{\cancel{(2x+1)}(2x-1)}$

$\boxed{\dfrac{1}{2x-1}}$

**9.** $\dfrac{c^{-1}}{a^{-1}+b^{-1}} = \dfrac{\frac{1}{c}}{\frac{1}{a}+\frac{1}{b}}$

Method 1: $\frac{1}{c} \div \frac{b}{b}\frac{1}{a}+\frac{1}{b}\cdot\frac{a}{a}$

$\dfrac{1}{c} \div \dfrac{b+a}{ab}$

$\dfrac{1}{c}\cdot\dfrac{ab}{b+a}$

$\boxed{\dfrac{ab}{c(b+a)}}$

Method 2: $\dfrac{\frac{1}{c}}{\frac{1}{a}+\frac{1}{b}}\cdot\dfrac{abc}{abc}$

$\dfrac{ab}{bc+ac}$

$\boxed{\dfrac{ab}{c(b+a)}}$