■ KEY ■

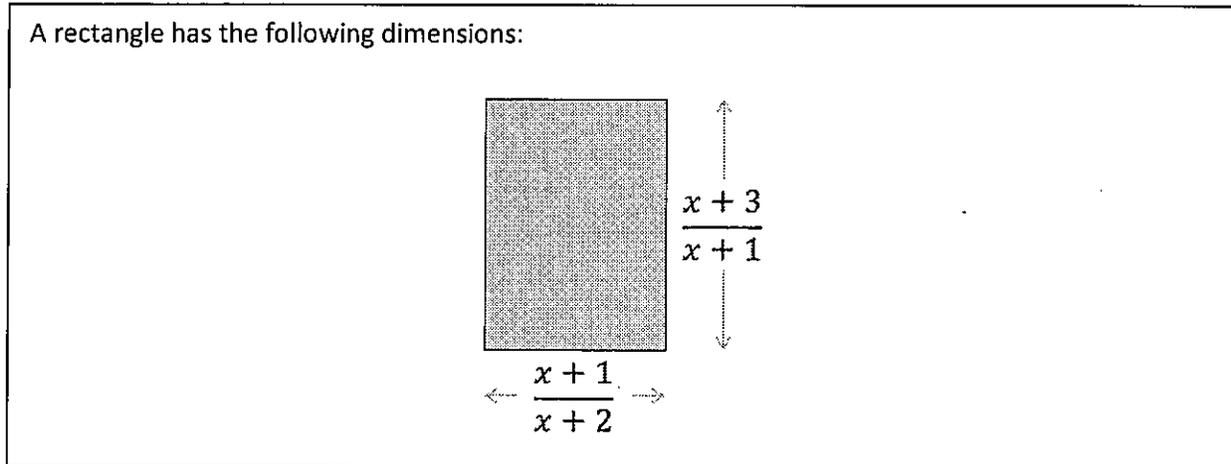## L07 – FQ – 6.3 Adding and Subtracting Rational Expressions

Use the following information to answer Q1-2:

A rectangle has the following dimensions:

$\dfrac{x+3}{x+1}$

$\dfrac{x+1}{x+2}$

Q1: The area of the rectangle can be simplified as $\dfrac{x+a}{x+b}$, where $x \neq -c, -d$. The values of *a, b, c,* and *d*

are ___, ___, ___, and ___.

*(Record your **four-digit** answer in the Numerical Response boxes below)*

3	2	1	2

3	2	2	1

$Area = (Length)(Width)$

$= \left(\dfrac{x+3}{x+1}\right)\left(\dfrac{x+1}{x+2}\right) = \dfrac{x+3}{x+2}$ where $x \neq -1, -2$

Q2: The perimeter of the rectangle can be simplified as $\dfrac{2(ax^2+bx+c)}{(x+1)(x+2)}$, where *a, b,* and *c* are ___, ___,

and ___.

*(Record your **three-digit** answer in the Numerical Response boxes below)*

2	7	7	

$Perimeter = 2(Length) + 2(Width)$

$= 2\left[\dfrac{x+3}{x+1}\right] + 2\left[\dfrac{x+1}{x+2}\right] = 2\left[\dfrac{x+3}{x+1}\left(\dfrac{x+2}{x+2}\right)\right] + 2\left[\dfrac{x+1}{x+2}\left(\dfrac{x+1}{x+1}\right)\right]$

$= 2\left[\dfrac{x^2+5x+6}{(x+1)(x+2)}\right] + 2\left[\dfrac{x^2+2x+1}{(x+1)(x+2)}\right]$

$= \dfrac{2(2x^2+7x+7)}{(x+1)(x+2)}$

$a = 2$
$b = 7$
$c = 7$

KEY

Q3: The expression $\dfrac{x+1}{x-2} + \dfrac{x+1}{x+2}$ simplifies to $\dfrac{2(x+a)}{(x-b)(x+c)}$. The values of $a, b,$ and c are

—, —, and —.

(Record your ~~three-digit~~ answer in the Numerical Response boxes below)

1	2	2	

$= \dfrac{x+1}{x-2}\left(\dfrac{x+2}{x+2}\right) + \dfrac{x+1}{x+2}\left(\dfrac{x-2}{x-2}\right)$

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

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

$a = 1$
$b = 2$
$c = 2$

Q4: *(Long Answer)* Given the expression $\dfrac{2x-3}{x+2} + \dfrac{2x-3}{2x+3}$, simplify and factor fully. Identify all non-permissible values. *(3 marks)*

$\searrow x \neq -2 \qquad \searrow x \neq -3/2$

$\dfrac{2x-3}{x+2}\left(\dfrac{2x+3}{2x+3}\right) + \dfrac{2x-3}{2x+3}\left(\dfrac{x+2}{x+2}\right) = \dfrac{4x^2-9}{(x+2)(2x+3)} + \dfrac{2x^2+x-6}{(x+2)(2x+3)}$

$= \boxed{\dfrac{6x^2+x-15}{(x+2)(2x+3)}} = \boxed{\dfrac{(2x-3)(3x+5)}{(x+2)(2x+3)}}$ where $\boxed{x \neq -2, -3/2}$

$+10 \quad -9$
$6x^2+x-15 \qquad \square + \square = 1$
$\qquad\qquad\qquad \square \times \square = -90$
$6x^2+10x-9x-15$
$(6x^2+10x) + (-9x-15)$
$2x(3x+5) + -3(3x+5)$
$(3x+5)(2x-3)$

MARKING:

Beginning	0.0 – 2.5
Progressing	3.0 – 4.0
Competent	4.5 – 5.5
Exemplary	6.0