F) $\frac{14}{x^2-2x}=\frac{7}{x-2}-\frac{6}{x}$ $\times x(x-2)$

$\frac{14}{x(x-2)} = \frac{7}{x-2} - \frac{6}{x}$, $x \neq 0, 2$

LCD $= x(x-2)$

$\frac{14}{x(x-2)} \cdot x(x-2) = \frac{7}{x-2} \cdot x(x-2) - \frac{6}{x} \cdot x(x-2)$

$14 = 7x - 6x + 12$

$2 = x$ ← Non permissible

Soln & No Soln

G) $\frac{4}{x-2}-\frac{2x-3}{x^2-4}=\frac{5}{x+2}$

$\frac{4}{x-2} - \frac{(2x-3)}{(x-2)(x+2)} = \frac{5}{x+2}$, $x \neq 2, -2$

$\frac{4}{x-2} \cdot (x-2)(x+2) - \frac{(2x-3)}{(x-2)(x+2)} \cdot (x-2)(x+2) = \frac{5}{x+2} \cdot (x+2)(x-2)$

$4x + 8 - 2x + 3 = 5x - 10$

$-3x = -21$

$x = 7$

Applications of Rational Expressions 4-5 (all the way throughout the Unit) DOP LA (ON MIDTERM EXAM LAST QUESTION)

You should be able to

- 1) write a rational expression equation to solve a problem
- 2) solve the rational expression equation

Examples

1. The sum (+) of a number and its reciprocal is ($=$) $\frac{5}{2}$. Write a rational equation for this scenario and determine what is the number.

Let x = the number

$\frac{1}{x}$ = the reciprocal of the number.

Equation: $x + \frac{1}{x} = \frac{5}{2}$ $\quad x \neq 0$, LCD $= 2x$

$$x \cdot 2x + \frac{1}{x} \cdot 2x = \frac{5}{2} \cdot 2x$$

$$2x^2 + 2 = 5x$$

$$2x^2 - 5x + 2 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{5 \pm \sqrt{(-5)^2 - 4(2)(2)}}{2(2)}$$

$$x = \frac{5 \pm \sqrt{9}}{4}$$

$$x = \frac{5 \pm 3}{4}$$

$x = 2$ or $x = 1/2$ $\quad x \neq 0$

Non-permissible= extraneous solution (causes division by 0)

Inadmissible Solutions: solutions that don't make sense

1) negative time
2) negative distance
3) negative height

Problem Solving

2. Sherry mows a lawn in 4 hours. Mary mows the same lawn in 5 hours. How long would it take both of them working together to mow the lawn?

Let x = time for both to mow lawn

Rational Expression Equation must be set up

	Time to Mow Lawn	Fraction of Lawn in 1 hour
Sherry	4	$1/4$ +
Mary	5	$1/5$
Both	x	$1/x$ =

$$\frac{1}{4} + \frac{1}{5} = \frac{1}{x} \qquad x \neq 0$$

$$LCD = 20x$$

$$\frac{1}{4} \cdot 20x + \frac{1}{5} \cdot 20x = \frac{1}{x} \cdot 20x$$

$$5x + 4x = 20$$

$$9x = 20$$

$$x = 2.2h$$

3. Terry can wax the floor of a gymnasium in 8 hours. Mimi takes 6 hours to wax the same floor. How long will it take both of them to wax the same floor together?

	Time to Wax	Fraction of Floor in 1 hour
Terry	8	1/8
Mimi	6	1/6
Both	x	1/x

$x \neq 0$

$$\frac{1}{8} + \frac{1}{6} = \frac{1}{x}$$

$$\frac{1}{8}\cdot 24x + \frac{1}{6}\cdot 24x = \frac{1}{x}\cdot 24x$$

$$3x + 4x = 24$$

$$7x = 24$$

$$x = 3.4\text{h}$$