

## 7.2 - Day 2 - Solving Rational Equations

**Ex.1:** Solve. (Don't forget to check for extraneous solutions!)

$$\frac{4}{2x+6} - \frac{1}{x} = \frac{x^2-5}{x^2+3x}$$

$$x \neq -3, 0$$

$$\frac{\cancel{x} \cdot 2 \cdot \cancel{2}}{\cancel{x} \cdot 2(x+3)} - \frac{1 \cdot \cancel{(x+3)}}{\cancel{x} \cdot \cancel{(x+3)}} = \frac{(x^2-5)}{x(x+3)}$$

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

$$\begin{aligned} x-3 &= x^2-5 \\ 0 &= x^2-x-2 \\ 0 &= (x-2)(x+1) \\ \boxed{x=2} \quad \boxed{x=-1} \end{aligned}$$

**Ex.2:** Solve.

$$\frac{6}{x+3} - \frac{5}{x-2} = \frac{-20}{x^2+x-6}$$

**Ex.3:** Solve.

restrictions  
 $x \neq -1, -2$

$$\frac{x-1}{x^2+3x+2} + \frac{2x}{x+2} = \frac{x-1}{x+1}$$

$$\frac{x-1}{(x+2)(x+1)} + \frac{2x \cdot \frac{(x+1)}{(x+1)}}{(x+2) \cdot \frac{(x+1)}{(x+1)}} = \frac{(x-1) \cdot \frac{(x+2)}{(x+2)}}{(x+1) \cdot \frac{(x+2)}{(x+2)}}$$

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

$$2x^2+3x-1 = x^2+x-2$$

$$\begin{array}{r} -x^2 - x + 2 \\ -x^2 - x + 2 \end{array}$$

$$x^2+2x+1=0$$

$$(x+1)(x+1)=0$$

$$x = -1 \text{ (mult. 2)}$$

restricted!

No Solution

**Ex.4:****WORD PROBLEM :**

Brian can travel 80 miles in his car in the same time it takes Jon to travel 30 miles on his bicycle. If Jon rides his bike 40 mi/hr slower than Brian drives his car, find the speed for each.

|                           |                                |
|---------------------------|--------------------------------|
| Brian                     | Jon                            |
| $\frac{80 \text{ mi}}{r}$ | $\frac{30 \text{ mi}}{(r-40)}$ |

$\frac{80}{r} = \frac{30}{r-40}$

$$80r - 3200 = 30r$$

$$-3200 = -50r$$

$$r = 64$$

Remember:  $d = rt$

|                  |                   |
|------------------|-------------------|
| Brian: 64 mi/hr. | $\frac{d}{r} = t$ |
| Jon: 24 mi/hr.   |                   |

$$64 - 40$$

**Ex.5:****WORD PROBLEM:**

It takes Max 2 hours to mow the lawn by himself. It takes Eric 2.5 hours by himself. If they work together, how long would it take them to mow the lawn (*Answer in hours, minutes, seconds*)?

Max: Eric: Together:

$$\frac{2.5}{2.5} \cdot \frac{1}{2} + \frac{2}{2} \cdot \frac{1}{2.5} = \frac{1}{x}$$

$$\frac{2.5}{5} + \frac{2}{5} = \frac{1}{x}$$

$$\frac{4.5}{5} = \frac{1}{x}$$

$$4.5x = 5$$

$$x = \frac{5}{4.5}$$

$$x = 1.1111\dots$$

1 hr., 6 min., 40 s.

**HOMWORK 7.2****Day 2:****P. 546**

**9-19 odds, 37,  
38, 39, 48, 50**

**HOMEWORK - Day 2: P. 546: 9-19 odds, 37, 38, 39, 48, 50****9.** 10**11.** 2**13.** -1, 12**15.** -1.45, -1.65**17.** -3, -2**19.** 1**39.** 4 test scores**37.**  $1\frac{5}{7}$  hr → about 1 hr., 42 min., 51 s.**38.** you: 6 hours, 45 min.  
friend: 13 hours, 30 min.**48.** -4**50.** 6

$$\frac{1 \pm \sqrt{241}}{10}$$