**Worksheet # 5 Rational Equations**

* Show all work on a separate sheet (diagrams, explanations, calculations… etc)

1. Solve. State non-permissible value(s) and check for extraneous roots.

**ANSWERS**

X = $\pm 10$

X = 9

No solution

X = 2, 3

No solution

X= 4, $\frac{-1}{2}$

X= $\pm 10\sqrt{5}$

X = 0, $\frac{-2}{3}$

X= $\frac{-1\pm \sqrt{10}}{3}$

75 km/h

600 km/h

1. $\frac{50}{x}=\frac{5x}{10}$ b) $\frac{x}{3}-\frac{3}{x}=\frac{x-1}{3}$

 c) $\frac{3}{2x-4}=\frac{3}{x-2}$ d) $\frac{5}{x-1}-\frac{12}{x^{2}-1}=1$

 e) $\frac{x^{2}-4}{x+2}=3x+2$ f) $x-\frac{7}{2}=\frac{2}{x}$

 g) $\frac{50}{x}-\frac{40}{x+10}=1$ h) $\frac{3x^{2}}{x^{2}-1}=\frac{x}{x+1}+\frac{x}{1-x}$

 i) $\frac{2x}{x-1}-\frac{4}{3-x}=\frac{5x^{2}-7}{x^{2}-4x+3}$

**2.** The average speed of an airplane is eight times as fast as the average speed of a train. To travel 1200 km, the train requires 14 h more than the airplane. Determine the average speeds of the train and the airplane.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Distance (mi)** | **Speed (mph)** | **Time (h)** |
| **Fast** |  |  |  |
| **Slow** |  |  |  |
| **Total:** |  |  |  |

**BONUS: Applications of Rational Expressions**

**3. DISTANCE = SPEED X TIME**

Each week Angela flies her Cessna – 150 500 km from Lethbridge to Moose Jaw. After a brief stopover, she returns to Lethbridge. On both trips, the air speed is 165 km/h. On the flight out there is a constant tail wind, and on the return trip a constant head wind of the same speed.

1. Suppose you know the wind speed. Determine the formula to calculate the total time for the round trip (not counting the stopover).

 b) Calculate the time for the round trip for each windspeed.

 i) 30 km/h ii) 40 km/h

**4. VOLUME & AREA PROBLEM:**

# A candy company sells candies in boxes. Each box has a square base with sides 17.5 cm and a volume of approximately 1070 cm3. The company plans to redesign the box to have a smaller base. It must have a square base and contain the same volume.

#

#  a) Calculate the height of the box.

# Suppose you know the decrease in the length of the base. Determine a formula to calculate the increase in height.

# c) What is the increase in height for each decrease in the length of the base?

#  i) 1.5 cm ii) 3.0 cm