

### Answer on Question #48922 – Math – Algebra

A pump can fill a milk tank in 2 hours. Because of leakage problem it took 20 minutes more to fill the tank. The plant supervisor wants to find how much time would the leak take to empty the full tank.

#### Solution:

We can fill a tank in 120 minutes (1hour = 60 minutes). According to the condition of the task we know that it took 20 minutes more to fill the tank because of leakage problem. So we can write the following that the extra time will be equal.

$$120 + 20 = 140 \text{ minutes.}$$

We let the capacity of tank be C liters. Then filling rate of the pump when there is no leak is equal to  $\frac{C}{2}$  liters/hour.

$$\text{Filling rate of the pump and leak together} = \frac{C}{(2+\frac{20}{60})} = \frac{C}{(2+\frac{1}{3})} = \frac{C}{\frac{6+1}{3}} = \frac{C}{\frac{7}{3}} = \frac{3C}{7} \text{ liters/hour.}$$

$$\text{Now we find the emptying rate of leak} = \frac{C}{2} - \frac{3C}{7} = \frac{7C-6C}{14} = \frac{C}{14}$$

$$\text{Then the leak can empty tank in} = \frac{\text{Capacity}}{\text{Leak rate}} = \frac{C}{\frac{C}{14}} = \frac{14C}{C} = 14 \text{ hours}$$

The time would the leak take to empty the full tank is equal to 14 hours.