

August 25th

A large empty tank can store 1000 gallons of water. There are two pipes; one can fill it in 9 hours and the other will empty it in 12 hours.

If both pipes are open, how many hours will it take to fill the tank?

Rate of filling = $\frac{1000}{9}$ gallons per hour

Rate of emptying = $\frac{1000}{12} = \frac{250}{3}$ gallons per hour

Net rate of filling = $\frac{1000}{9} - \frac{250}{3} = \frac{250}{9}$ gallons per hour

It will take $1000 \div \frac{250}{9} = \mathbf{36 \text{ hours}}$