Pipes and Cistern

1. **Inlet:**
   A pipe connected with a tank or a cistern or a reservoir, that fills it, is known as an inlet.

2. **Outlet:**
   A pipe connected with a tank or cistern or reservoir, emptying it, is known as an outlet.

3. If a pipe can fill a tank in \( x \) hours, then:
   
   \[
   \text{part filled in 1 hour} = \frac{1}{x}.
   \]

4. If a pipe can empty a tank in \( y \) hours, then:
   
   \[
   \text{part emptied in 1 hour} = \frac{1}{y}.
   \]

5. If a pipe can fill a tank in \( x \) hours and another pipe can empty the full tank in \( y \) hours (where \( y > x \)), then on opening both the pipes, then

   \[
   \text{the net part filled in 1 hour} = \left(1 - \frac{1}{x}\right).
   \]

6. If a pipe can fill a tank in \( x \) hours and another pipe can empty the full tank in \( y \) hours (where \( x > y \)), then on opening both the pipes, then

   \[
   \text{the net part emptied in 1 hour} = \left(1 - \frac{1}{y}\right).
   \]