

### Answer on Question #50777-Physics-Mechanics-Kinematics-Dynamics

A fulfilled well is 10 m deep and has a radius of 4 m. A 6.87 H.P pump is used to empty the well in 20 minutes. But after emptying half of the well, it got damaged. After how much time the pump got damaged if another pump is used to empty the rest of the well in the limited time, will the power of the 2nd pump be same of the 1st one?

#### Solution

Volume of the well is  $\pi(4)^2 10 = 160\pi m^3$ .

Power of the pump is 6.87 HP.

Time to empty full well is 20 mins.

Time to empty half well is 10 mins. (When the pump got damaged)

Time to empty the rest is 10 mins.

Time required by 6.87 HP pump to empty  $\frac{1}{2}$  well is 10 mins.

Power of the 2nd pump required to empty the well in 10 mins is  $\geq 6.87$  HP.