Answer on Question #50815-Physics-Mechanics-Kinematics-Dynamics

A pump can empty a 7.5 m deep and 0.9 m radius well in 30 mints. But the pump got damaged after emptying half of the well. Then another pump is used to empty the rest which can empty it in 15 mints. What is the ratio of the power of the two pumps?

For the 2nd pump the time given here is it the time for emptying whole well or emptying the rest after the 1st one damaged?

Solution

For the 2nd pump the time given here is it the time for emptying whole well. If not - the powers of the two pumps are equal (the ratio is 1)!

To fulfill the well we need energy E.

The power of the pump is

$$P = \frac{E}{t}.$$

Thus, the ratio of the power of the two pumps is

$$\frac{P_2}{P_1} = \frac{t_1}{t_2} = \frac{30 \text{ mints}}{15 \text{ mints}} = 2.$$

Answer: 2.