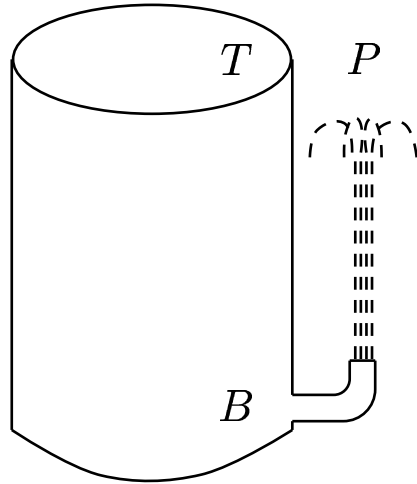


A fountain spout is attached to a hole at the bottom of a bucket. If friction effects are negligible, this fountain squirts water to a height.



Choose one

- A) above the water level of the bucket.
- B) which equals to the water level of the bucket.
- C) less than the water level of the bucket.

Label the water level in the container at the top by “1”, the spout at the bottom by “2”.

Bernoulli’s principle implies that

$$P_1 + \frac{1}{2} \rho v_1^2 + \rho g y_1 = P_2 + \frac{1}{2} \rho v_2^2 + \rho g y_2 .$$

The atmospheric pressure $P_1 = P_2$.

For large enough bucket, v_1 , the speed at which the water level is lowering, is negligible, *i.e.*, $v_1 = 0$.

Setting $y_1 - y_2 = h$, one gets $v_2 = \sqrt{2 g h}$.

So the water shoots up with the same speed, as that if it were to free-fall from the top.

Applying the Bernoulli’s principle one more time, one finds that the water shoots up to the same height of h .

Answer B

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