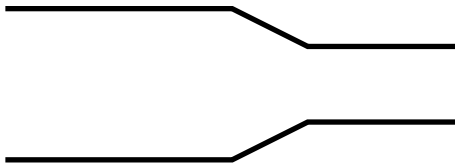


Question 1

An *incompressible* ideal fluid flows into a tube as illustrated. The area of the opening on the left is 4 times that of the opening on the right. Let Q_{left} be the volume flow rate on the left and Q_{right} be the volume flow rate on the right.

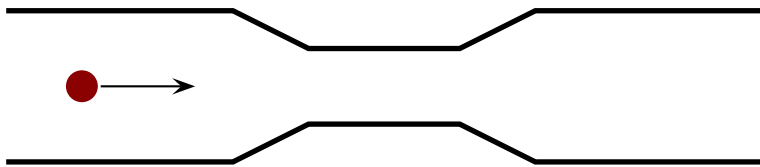


Which of the following is true regarding the volume flow rates?

1. $Q_{\text{right}} = Q_{\text{left}}$.
2. $Q_{\text{right}} = 4 Q_{\text{left}}$.
3. $Q_{\text{right}} = \frac{1}{4} Q_{\text{left}}$.
4. $Q_{\text{right}} > 4Q_{\text{left}}$.

Question 2

An ink molecule follows the flow of liquid horizontally through the illustrated pipe.

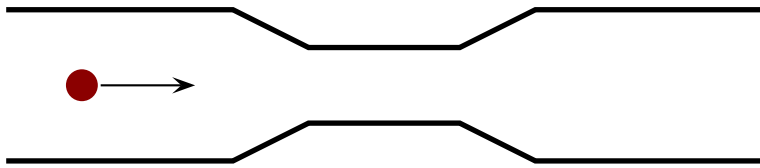


Which of the following is true regarding the speed of the ink as it passes through the narrow section?

1. Same as wider section.
2. Larger than wider section.
3. Smaller than wider section.

Question 3

An ink molecule follows the flow of liquid horizontally through the illustrated pipe.

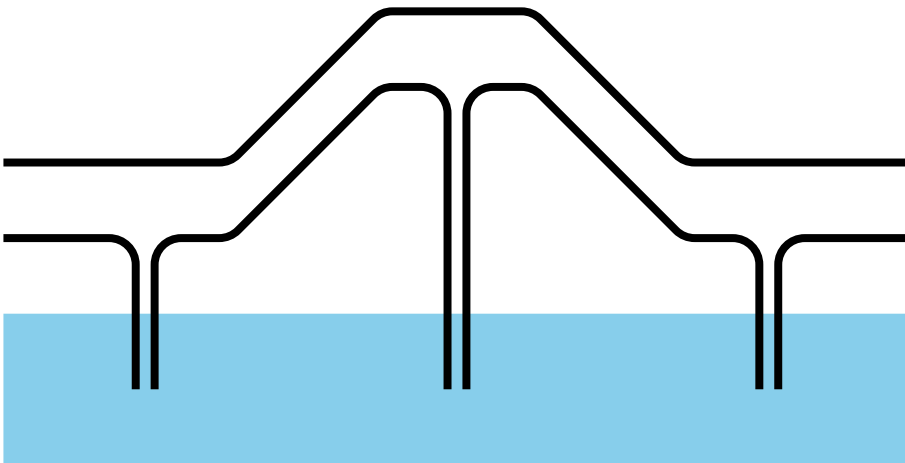


Which of the following is true regarding the pressure on the ink as it passes through the narrow section?

1. Same as wider section.
2. Larger than wider section.
3. Smaller than wider section.

Question 4

A tube is configured as illustrated. Vertical tube segments protrude into a liquid.



Gas is made to flow through the tube from left to right. Which of the following is correct about the heights that the liquid rises in the vertical segments?

1. Highest on left, medium in middle, lowest on right.
2. Lowest on left, medium in middle, highest on right.
3. Left and right same, middle higher.
4. Left and right same, middle lower.
5. Same in all.