

# Bernoulli's Equation

**Line 1:** Chapter 15: Fluid Dynamics and Bernoulli's Principle

**Line 2:**

**Line 3:** Bernoulli's equation is a fundamental principle in fluid dynamics that describes

**Line 4:** the relationship between pressure, velocity, and elevation in a flowing fluid.

**Line 5:**

**Line 6:** The mathematical form of Bernoulli's equation is:

**Line 7:**

**Line 8:**  $P + \frac{1}{2}\rho v^2 + \rho gh = P_0 + \frac{1}{2}\rho v_0^2 + \rho gh_0 = \text{constant}$

**Line 9:**

**Line 10:** Where:

**Line 11:** -  $P$  = pressure of the fluid

**Line 12:** -  $\rho$  = density of the fluid

**Line 13:** -  $v$  = velocity of the fluid

**Line 14:** -  $g$  = acceleration due to gravity

**Line 15:** -  $h$  = height above reference point

**Line 16:**

**Line 17:** This equation demonstrates the conservation of energy in fluid flow.

**Line 18:** Applications include aircraft wing design, venturi meters, and water flow systems.

**Line 19:**

**Line 20:** Daniel Bernoulli first formulated this principle in his work "Hydrodynamica" in 1738.