

Answer on Question #43270, Physics, Mechanics | Kinematics | Dynamics

What is the difference in blood pressure between the top of the head and bottom of the feet of 1.6m tall person standing vertically (density of blood $\rho = 1.05 \times 10^3 \text{ kg/m}^3$)

- A. $1.6 \times 10^4 \text{ Pa}$
- B. $1.6 \times 10^5 \text{ Pa}$
- C. $3.2 \times 10^5 \text{ Pa}$
- D. $1.6 \times 10^6 \text{ Pa}$
- E. $3.2 \times 10^6 \text{ Pa}$

Solution:

The difference in static pressure is density (ρ) times gravity (g) times difference in height (h)

$$\Delta P = \rho g \Delta h$$

Thus,

$$\Delta P = (1.05 \times 10^3 \text{ kg/m}^3)(9.8 \text{ m/s}^2)(1.6 \text{ m}) = 1.65 \times 10^4 \text{ Pa}$$

Answer: A. $1.6 \times 10^4 \text{ Pa}$