## Answer on Question 43272, Physics, Other

In order to find the number of capillaries, one has to use the continuity equation.
The amount of blood that passes through aorta in time $\Delta t$ is $Q_0 = \pi R_0^2 v_0 \Delta t$ , where $R_0$ is the radius of aorta, $v_0$ is the speed of blood, passing through aorta.
The amount of blood that passes through unknown number $N$ capillaries in time $\Delta t$ is $Q_1 = N \pi r^2 v_1 \Delta t$ .

In our task, $R_0 = 1 \cdot 10^{-2} m$ , $v_0 = 30 \cdot 10^{-2} \frac{m}{s}$ , $r = 4 \cdot 10^{-6} m$ , $v_1 = 5 \cdot 10^{-4} \frac{m}{s}$ .

From the continuity equation, $Q_0 = Q_1$ , thus $N = \frac{v_0 R_0^2}{v_1 r^2} = 3.75 \cdot 10^9 \approx 4 \cdot 10^9$ .