Calculus 2 Workbook

Biology

CARDIAC OUTPUT

■ 1. Find the cardiac output, in liters/second, if 8 mg of dye is injected into the heart and the amount of dye remaining in the heart t seconds after the injection is modeled by $C(t) = 14te^{-0.6t}$. Assume $0 \le t \le 20$.

■ 2. Find the cardiac output, in liters/second, if 4 mg of dye is injected into the heart and the amount of dye remaining in the heart t seconds after the injection is modeled by $C(t) = 6te^{-0.2t}$. Assume $0 \le t \le 5$.

■ 3. Find the cardiac output, in liters/second, if 9 mg of dye is injected into the heart and the amount of dye remaining in the heart t seconds after the injection is modeled by $C(t) = 28te^{-0.85t}$. Assume $0 \le t \le 10$.

POISEUILLE'S LAW

■ 1. Use Poiseuille's law to find the flow of blood in the human artery in which $n = 0.031$, $R = 0.008$ cm, $L = 6$ cm, and $P = 3,900$ dynes/cm^2. Express the answer using scientific notation.

■ 2. Use Poiseuille's law to find the flow of blood in the human artery in which $n = 0.028$, $R = 0.007$ cm, $L = 3.5$ cm, and $P = 3,600$ dynes/cm^2. Express the answer using scientific notation.

■ 3. Use Poiseuille's law to find the flow of blood in the human artery in which $n = 0.027$, $R = 0.006$ cm, $L = 2.5$ cm, and $P = 3,800$ dynes/cm^2. Express the answer using scientific notation.

THEOREM OF PAPPUS

■ 1. Use the Theorem of Pappus to find the exact volume of a right circular cone with radius 6 feet and height 18 feet.

■ 2. Use the Theorem of Pappus to find the exact volume of a right circular cone with radius 8 inches and height 9 inches.

■ 3. Use the Theorem of Pappus to find the exact volume of a right circular cone with radius 12 centimeters and height 7 centimeters.