

Given: Nitroglycerin enlarges blood vessels that have become too constricted. The cross-sectional area of a particular vessel t hours after nitro is administered is given by

$$A(t) = .01t^2 \text{ square centimetres, where } 1 \text{ hr} \leq t \leq 5 \text{ hrs}$$

Draw : a sketch of this vessel and the cross section which is a _____.

Solve: $A = \pi r^2$ for the radius

Complete:

Time after nitro	1 hour	2 hours	3 hours	4 hours	5 hours
Cross-sectional area of blood vessel -- area of circle					
Length of the radius of the circle					

Find: the instantaneous rate of change (increase) of the vessel's area t hours after receiving nitroglycerin; that is,

at t hours the area is increasing at the rate of _____ square centimetres per hour

Find: the instantaneous rate of increase of the vessel's area 4 hours after receiving nitroglycerin

Find: the amount the vessel's area increases from the 4th to the 5th hour

Using the discrete method: $A(5) - A(4)$

Area of vessel increase =

Using the continuous method: $A'(4)$ assuming rate of increase stays the same for this one hour

Area of vessel increase =

Which method yields the "actual" increase in the area of the vessel during this hour?

Recall:

Functions are models or representations of reality.