

1.

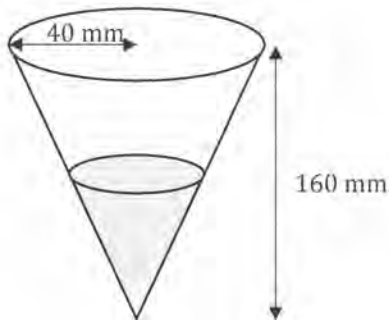


Figure 1

Figure 1 shows an ice cream cone with a height of 160 mm and radius of 40 mm. The hollow cone, which is initially empty, is placed centrally under the ice cream machine.

The ice cream flows at a constant rate of $k \text{ mm}^3 \text{ s}^{-1}$.

The rate at which the height of the ice cream is rising 10 seconds after it was placed under the machine is $\frac{1}{2} \text{ mm s}^{-1}$.

Determine the exact value of k .