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- 2017 8** A stone drops into a pond, creating a circular ripple. The radius of the ripple increases from 0 cm, at a constant rate of 5 cm s^{-1} . At what rate is the area of enclosed within the ripple increasing when the radius is 15 cm? **1**
- (A) $25\pi \text{ cm}^2 \text{ s}^{-1}$ (B) $30\pi \text{ cm}^2 \text{ s}^{-1}$ (C) $150\pi \text{ cm}^2 \text{ s}^{-1}$ (D) $225\pi \text{ cm}^2 \text{ s}^{-1}$

C

$$A = \pi r^2$$

$$\frac{dA}{dr} = 2\pi r$$

$$\frac{dA}{dr}(15) = 30\pi$$

$$\frac{dA}{dt} = \frac{dA}{dr} \times \frac{dr}{dt}$$

$$= 30\pi \times 5$$

$$= 150\pi \quad \therefore 150\pi \text{ cm}^2 \text{ s}^{-1}$$

State Mean:
0.8

* These solutions have been provided by [projectmaths](#) and are not supplied or endorsed by NESA.