



- MX** **9** A stone drops into a pond, creating a circular ripple. **1**
SP The radius of the ripple increases from 0 cm at a constant rate of 5 cm s^{-1} .
At what rate is the area enclosed within the ripple increasing when the radius is 15 cm?
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

$$A = \pi r^2$$

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

Substitute $r = 15$:

$$\frac{dA}{dt}(15) = 2\pi(15)$$

$$= 30\pi$$

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

$$= 30\pi \times 5$$

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

* These solutions have been provided by [projectmaths](http://projectmaths.com.au) and are not supplied or endorsed by NESA.

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