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 $r = 15$:

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

$$= 30\pi$$

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

$$= 30\pi \times 5$$

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

* These solutions have been provided by *projectmaths* and are not supplied or endorsed by NESA.