

25. The circumference of a circle is increasing at 0.5 m/min . What is the rate of change of the area of the circle when the radius is 4 meters?

- (A) $2 \text{ m}^2/\text{min}$
 (B) $6 \text{ m}^2/\text{min}$
 (C) $4\pi \text{ m}^2/\text{min}$
 (D) $\frac{1}{2\pi} \text{ m}^2/\text{min}$
 (E) $\frac{1}{4\pi} \text{ m}^2/\text{min}$

$$\textcircled{1} \frac{dC}{dt} = 0.5$$

$$\textcircled{2} A = \pi r^2$$

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

$$\textcircled{3} C = 2\pi r$$

$$\frac{dC}{dt} = 2\pi \frac{dr}{dt}$$

$$0.5 = 2\pi \frac{dr}{dt}$$

$$\frac{1}{4\pi} = \frac{dr}{dt}$$

$$\textcircled{4} \frac{dA}{dt} = 2\pi(4)\left(\frac{1}{4\pi}\right)$$

$$= 2$$

Answer

26. Let $f(x)$ be the function defined by $f(x) = \begin{cases} x & \text{for } x \leq 0 \\ |x+1| & \text{for } x > 0 \end{cases}$.

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