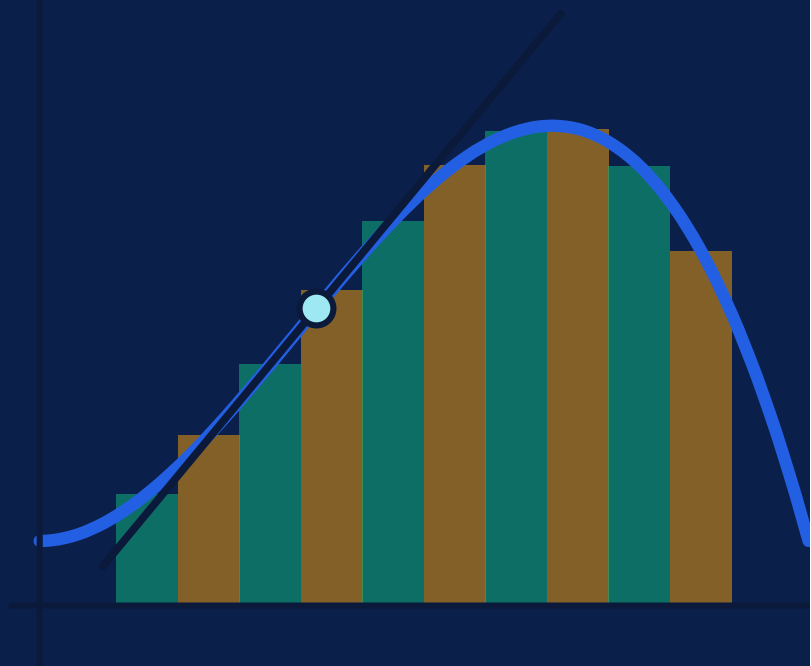


Calculus

**Power rule** **B**

$$f(x) = x^n \Rightarrow f'(x) = nx^{n-1}$$

Standard derivatives **B**

$$(\sin x)' = \cos x, \quad (\cos x)' = -\sin x, \quad (e^x)' = e^x, \\ (\ln x)' = \frac{1}{x}$$

Chain rule **B**

$$y = g(u), \quad u = f(x) \Rightarrow \frac{dy}{dx} = \frac{dy}{du} \cdot \frac{du}{dx}$$

Product rule **B**

$$\frac{d}{dx}(uv) = u \frac{dv}{dx} + v \frac{du}{dx}$$

Quotient rule **B**

$$\frac{d}{dx} \left(\frac{u}{v} \right) = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$$

Linear inside

$$\frac{d}{dx} e^{kx} = k e^{kx}, \quad \frac{d}{dx} \sin kx = k \cos kx, \quad \frac{d}{dx} \ln(kx) = \frac{1}{x}$$

Tangent; normal gradient at $x = a$

$$y - f(a) = f'(a)(x - a); \quad m_{\text{normal}} = -\frac{1}{f'(a)}$$

Increasing / decreasing

$$f'(x) > 0; \quad f'(x) < 0$$

B given in the exam. Learn the rest.