

16. The best way to do this problem is to simplify $f(x) = x\sqrt[3]{x} = x(x^{\frac{1}{3}}) = x^{\frac{4}{3}}$.

Therefore, $f'(x) = \frac{4}{3}x^{\frac{1}{3}}$.

The correct choice is (C).

17. Let $u = x + 2 \Rightarrow du = dx$

$$\int_k^6 \frac{dx}{x+2} = \int \frac{du}{u} = \ln |u| = \ln |x+2| \Big|_k^6 = \ln 8 - \ln |k+2| = \ln \left| \frac{8}{k+2} \right|.$$

Since $\int_k^6 \frac{dx}{x+2} = \ln k$ (given), $\ln \left(\frac{8}{k+2} \right) = \ln k$, or $\frac{8}{k+2} = k$.

Solving for k , $k^2 + 2k = 8 \Rightarrow k = 2, -4$. Since $k > 0$, the required value of k is 2.

The correct choice is (B).