Inverse Triganometric Functions , Continuity and Differentiability

Time:1hr | Class 12 scert | Max mark: 30

Answer all

1. (a) Derivative of e^{sinx} is —— **(1)**

   (b) If $y = 3sinx - 4cosx$, prove that $\frac{d^2y}{dx^2} + y = 0$ **(2)**

2. (a) Find $\frac{dy}{dx}$ if $y = cos^{-1}(\frac{1-x^2}{1+x^2})$ **(3)**

3. (a) Show that $tan^{-1}(\frac{2}{11}) + tan^{-1}(\frac{7}{24}) = tan^{-1}(\frac{1}{2})$ **(2)**

   (b) Find the value of $sin^{-1}(sin(\frac{2\pi}{3}))$ **(2)**

4. (a) Check whether $f(x) = |x|$ is continuous **(2)**

   (b) Show that $f(x) = |1 + x + |x||$ is a continuous function **(2)**

5. (a) The principal value of $sin^{-1}\frac{1}{2}$ is —— **(1)**

   (b) Find $tan^{-1}[2cos(2sin^{-1}\frac{1}{2})]$ **(3)**

6. (a) If $x = sin\theta - sin2\theta$ and $y = cos\theta - cos2\theta$ find $\frac{dy}{dx}$ **(1)**

   (b) Differentiate e^{x^3} w.r.t.x **(2)**

   (c) Find $\frac{dy}{dx}$ if $sin^2y + cosxy = k$ **(3)**

7. (a) Express $tan^{-1}(\frac{cosx}{1-sinx})$, $\frac{-3\pi}{2} < x < \frac{\pi}{2}$ in the simplest form **(4)**

   (b) Show that $sin^{-1}(2x\sqrt{1-x^2}) = 2sin^{-1}x$ **(2)**