

10. Given $g(x) = \arctan(1/x)$, evaluate $\lim_{h \rightarrow 0} \frac{g(2+h) - g(2)}{h}$

- a) $\frac{4}{5}$ b) $\frac{1}{2}$ c) $-\frac{1}{5}$ d) $\frac{\ln 2}{2}$ e) none of these

11. Suppose that $f(x) = \int_{0.5}^{x^4} \frac{t}{\sqrt{t^3+2}} dt$. Then $f'(1) =$ _____.

- a) $\frac{-4}{\sqrt{3}}$ b) $\frac{1}{\sqrt{3}}$ c) $\frac{-1}{\sqrt{3}}$ d) $\frac{4}{\sqrt{3}}$ e) none of these

16. Evaluate $\int_0^1 8x^3 e^{2x} dx$

- a) $e^2 + 2$ b) $e^2 + 3$ c) $e^2 + 4$ d) $e^2 + 8$ e) none of these

21. To evaluate the integral $\int \frac{\sqrt{x^2-9}}{x} dx$, a trig substitution may be made. The differential, dx , for the best trig substitution is

- a) $3\cos(\theta)d\theta$ b) $-3\sin(\theta)d\theta$ c) $3\sec^2(\theta)d\theta$ d) $3\sec(\theta)\tan(\theta)d\theta$ e) none of these

28. Which of the following is one of the terms of a n th degree Taylor Polynomial for $f(x) = \ln(x)$ at $c = 1$?

- a) $\frac{-x^2}{2}$ b) $\frac{x^3}{3}$ c) $\frac{-(x+1)^2}{2}$ d) $\frac{(x+1)^3}{3}$ e) none of these

34. Find the interval of convergence of the series: $1 - \frac{1}{2}(x-3) + \frac{1}{3}(x-3)^2 + \dots + (-1)^n \frac{1}{n+1}(x-3)^n + \dots$

- a) All Real numbers b) $(2, 4)$ c) $(1, 3)$ d) $x = 3$ only e) none of these

35. Given the parametric function $\begin{cases} x = 3t^2 + 5t \\ y = 4t - 1 \end{cases}$, find $\frac{d^2y}{dx^2}$.

- a) $\frac{-24}{(6t+5)^3}$ b) $\frac{-6}{6t+5}$ c) $\frac{6t+5}{-24}$ d) 0 e) none of these