MATHS

BOOKS - RESONANCE DPP ENGLISH

LIMITS AND DERIVATIVES

Others

1. Let $(\lim)_{x\rightarrow 0}\frac{[x]^2}{x^2} = Iand(\lim)_{x\rightarrow 0}\frac{[x]^2}{x^2} = m,$ where $[.]$ denotes greatest integer. Then l exists but m does not m exists but l does not $\perp h$ l and m exist (d) neither $\ln$ or m exists

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2. Which of the following is/are true? (a) $\lim_{x \to \infty} \frac{(2+x)^{40}(4+x)^{5}}{(2-x)^{45}} = 1$ (b) $\lim_{x \to 0} \frac{1-\cos^{3}x}{x\sin x\cos x} = \frac{3}{2}$ (c) $\lim_{x \to 0} \frac{\ln(1+2x) - 2\ln(1+x)}{x^{2}} = -1$ (d) $\lim_{x \to \infty} \frac{\cot^{-1}\left(\sqrt{x+1} - \sqrt{x}\right)}{\sec^{1}\left(\frac{2x+1}{(x-1)^{2}}\right)} = 1$

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3. If $f(x) = x^3 + 2x^2 + 3x + 4$ and $g(x)$ is the inverse of $f(x)$ then $g'(4)$ is equal to- $\frac{1}{4}$ (b) 0 (c) $\frac{1}{3}$ (d) 4

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4. If $(\lim)_{x \to \infty}\left(\sqrt{px^2 + qx} - rx\right) = 2, then$ $q = 4r$ b. $q = 2r$ c.$q = r$ d. $q = 6r$

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5. $\left(\lim\right)_{x\vec{0}}\frac{1-\cos^3 x}{x sinx \cos x}$ is equal to 3 b. $\frac{1}{2}$ c.$\frac{3}{2}$ d. $-\frac{3}{2}$

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6. $\left(\lim\right)_{x\vec{0}}\frac{l\text{n}(1+2x)-2\ln(1+x)}{x^2}$ is equal to 3 b. 1 c.-1 d. 0

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7. $\left(\lim\right)_{x\vec{0}}\left(\frac{\sqrt{1+x\sin x}-\sqrt{\cos 2x}}{\tan^2(x/2)}\right)$ is equal to $\frac{1}{6}$ b. 6 c.3 d. 2

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8. If $(\lim)_{x \overrightarrow{0}} \frac{(1+a^3)+8e^{\frac{1}{x}}}{1+(2+b+b^2)e^{\frac{1}{x}}} = 2,$ where $a, b \in R,$ then the possible ordered pair (a,b) is $(2, -2)$ (b) $(1, -2)$ $(1, 1)$ (d) $(-1, 1)$

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9. If $\lim_{x \to \infty} \frac{x^2+3x+5}{4x+1+x^k}$ exists then K (a)$k = 2$ (b) $k < 2$ (c) $k > 2$ (d) $k \geq 2$

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10. $\lim_{x \to (\pi)} \frac{1 - \sin\left(\frac{x}{2}\right)}{\cos\left(\frac{x}{2}\right)\left(\cos\left(\frac{x}{4}\right) - \sin\left(\frac{x}{4}\right)\right)}$

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11.

if $f(x) = \frac{a\cos x - \cos bx}{x^2}, x \neq 0 \text{ and } f(0) = 4,$

is continuous at x=0 , then the ordered pair (a,b) is

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12. The value of $\lim_{n \to \infty} \frac{1}{n} . \sum_{r=1}^{2n} \frac{r}{\sqrt{n^2 + r^2}}$ is equal to

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13. $\lim_{x \to \infty} \left(\frac{3}{x}\right)\left[\frac{x}{4}\right] = \frac{p}{q}$ find $p + q$

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