

CC1 – Multiple choice test

Tuesday, October 3rd

Duration : 45 min.

No document nor electronic devise authorized. Be sure to completely blacken your answer boxes, unclear answers will be automatically discarded.

Some questions may have several correct answers.

Name :
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Question 1 Mark the correct equalities

$\lim_{x \rightarrow 0} \frac{e^x - \cos x - x}{x^2} = 2$ $\lim_{x \rightarrow 0} \frac{e^x - \sqrt{1+2x}}{\ln(1+x)} = 1$ $\lim_{x \rightarrow 0} \frac{1 - \cos x}{\sin^2 x} = \frac{1}{2}$
 $\lim_{x \rightarrow 0} \frac{e^x - 1}{\sqrt{1+x} - 1} = 2$

Question 2 Mark the correct equalities

$\lim_{x \rightarrow 0} \frac{\cos x - \sqrt{1-x^2}}{x^2 \sin^2 x}$ does not exist $\lim_{x \rightarrow 0} \left(\frac{1}{\sin^2 x} - \frac{1}{x^2} \right) = \frac{1}{3}$
 $\lim_{x \rightarrow 0} (\cos x)^{1/\sin^2 x} = \frac{1}{\sqrt{e}}$ $\lim_{x \rightarrow 0} (1+x)^{1/x} = 1$

Question 3 The series $\sum_n \left(\frac{n+3}{2n+1} \right)^{\ln n}$ is

divergent convergent

Question 4 The series $\sum_n \left(e - \left(1 + \frac{1}{n} \right)^n \right)$ is

divergent convergent

Question 5 The series $\sum_n \frac{n^2}{(n-1)!}$ is

divergent convergent

Question 6 The series $\sum_n \frac{1}{n + (-1)^n \sqrt{n}}$ is

divergent convergent

Question 7 The series $\sum_n \ln \left(\frac{n^2 + n + 1}{n^2 + n - 1} \right)$ is

divergent convergent

Question 8 The series $\sum_n \left(1 - n \ln \left(\frac{2n+1}{2n-1} \right) \right)$ is

CORRECTION

divergent convergent

Question 9 The series $\sum_{k=2}^{+\infty} \left(\frac{1}{\sqrt{k-1}} + \frac{1}{\sqrt{k+1}} - \frac{2}{\sqrt{k}} \right)$ equals

$\frac{1}{\sqrt{2}}$ $1 + \frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{2}}$ $1 - \frac{1}{\sqrt{2}}$

Question 10 The series $\sum_{n=0}^{+\infty} \left(\frac{n+1}{3^n} \right)$ equals

$+\infty$ $9/4$ $1/3$ $3/2$