الجامعة اللبنانية

كلية الصحة العامة

مباراة الدخول 2021 – 2022

مسابقة في الرياضيات

المدة : ٤٥ دقيقة عدد الصفحات: ١

For each question, circle the correct answer. (Only one answer is correct)

During a flu epidemic, $\frac{1}{4}$ of the population was infected despite the fact that $\frac{1}{3}$ of the population had been vaccinated. Furthermore among the infected people $\frac{1}{10}$ was vaccinated.
We randomly select a person and we consider the following events:
V: « the person is vaccinated ».
I: « the person is infected ».

1) The probability P (V/I) =

a) $\frac{1}{4}$ **b)** $\frac{1}{40}$ **c)** $\frac{1}{10}$ **d)** $\frac{3}{40}$

2) The probability P (I∩V) =

a) $\frac{1}{4}$ **b)** $\frac{1}{40}$ **c)** $\frac{1}{10}$ **d)** $\frac{3}{40}$

3) The probability P (I/V) =

a) $\frac{1}{4}$ **b)** $\frac{1}{40}$ **c)** $\frac{1}{10}$ **d)** $\frac{3}{40}$

Let f be the function defined by: $f(x) = x^4e^{-x}$.

4) The derivative $f'(x)$ =

a) $4x^3e^{-x}$ **b)** $-4x^3e^{-x}$ **c)** $x^3e^{-x}(-x+4)$ **d)** $\frac{x^5}{5}e^{-x}$

5) $\lim\limits_{x\to+\infty} f(x)$ =

a) $+\infty$ **b)** $-\infty$ **c)** 0 **d)** none of the proposed answers

6) $\lim\limits_{x\to-\infty} f(x)$ =

a) $+\infty$ **b)** $-\infty$ **c)** 0 **d)** none of the proposed answers

Let g be the function defined by : $g(x) = ln\left(\frac{1+x^2}{x^2+2x+5}\right)$.

7) The domain of g is :

a) $]-\infty;+\infty[$ **b)** $]0;+\infty[$ **c)** $]-\infty;0[$ **d)** $]-\infty;\ 0[\cup]0;+\infty[$

8) The equation of the asymptote to the curve of g at $+\infty$ is :

a) $y = 0$ **b)** $y = ln\left(\frac{1}{5}\right)$ **c)** $y = ln\left(\frac{2}{8}\right)$ **d)** $y = ln(5)$

Let h be the function defined by : $h(x) = \frac{ln\,x}{x}$.

9) An antiderivative of h is :

a) $\frac{1}{x^2}$ **b)** $\frac{1}{2}(\ln x)^2$ **c)** $(\ln x)^2$ **d)** $\frac{1}{2}(\ln x)$

Let k be the function defined by : $k(x) = lnx - x$.

10) The equation of the tangent to the curve of k at the point of abscissa 1 is:

a) $y = -1$ **b)** $y = x - 1$ **c)** $y = 1$ **d)** $y = x + 1$