Question	1 2 3 4 5 6 7 8 9 10

Description

> **Please read carefully,**
>
> - This exam has a running clock.
> - You have one attempt at each question.
> - Once you submit your answer for a question, you cannot change your answer.
> - If the time runs out on you, your exam will be submitted automatically including the questions you answered but did not submit.

## Instructions

بسم الله الرحمن الرحيم

Before starting the exam:

Take a deep breath, and relax.

During the exam:

- **The student may not use his textbook, course notes, and calculator or receive help from anyone or any other outside source.**
- **The student must complete the questions within the time frame allotted for the exam.**
- **The student must not stop the session and then return to it. This is especially important in the online environment where the system will "time-out" and not allow the student to reenter the exam site.**
- **Open Microsoft Team with camera using your mobile and keep it showing you clearly during the whole exam. Disabling the camera, means zero in the exam.**
- **You can leave during the last ten minutes of the exam; NOT BEFORE THAT.**

The graph of the function is given in the figure below.

$$y = f(x)$$
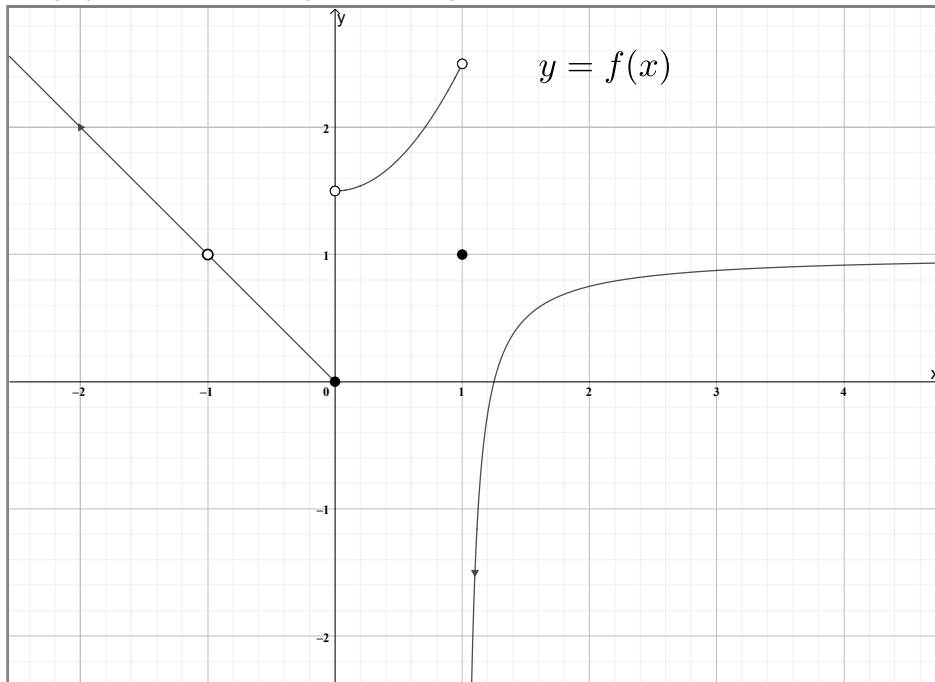
Which of the following is not true

○ f has a vertical asymptote   x=1

○ 🔑 The limit of   f as   x approach   0 exists

○ f has an infinite discontinuity at   x=1

○ f has a horizontal asymptote   y=1

○ f has a jump discontinuity at   x=0

✖

The equation $2^x = \dfrac{10}{x}$ has a root in the interval

○   [3,4]

○ 🔑   [2,3]

○   [1,2]

○   [−2,−1]

○   [−1,1]

✖

If

$$f(x) = \begin{cases} a-1 & if \quad x<5 \\ x-a & if \quad 5\le x\le 6 \\ b-x^2 & if \quad x>6 \end{cases}$$

is continuous at $x=5$ and at $x=6$, then $a =$ [＿＿＿] ✖ 🔑 3

and $b =$ [＿＿＿] ✖ 🔑 39

The function $y=f(x)=\dfrac{e^{-x}\,(x^2+x-2)}{x^2-1}$ has ---Select--- ∨ ✖ 🔑 one vertical asymptote(s) and ---Select--- ∨ ✖ 🔑

one horizontal asymptote(s).

Given the limit $\lim\limits_{x\to 1} (1-9x)=-8$, the largest value of δ which satisfies the definition of limit, when $\varepsilon=0.09$, is

- ○ 0.63
- ○ 0.09
- ○ 0.9
- ○ 2.7
- ○ 🔑 0.01

✖

If $g(x) = 76x^3+\ln x$ is the derivative of $f(x)$, then

$\lim\limits_{x\to 0} \dfrac{f(1+x)-f(1)}{x} =$ [＿＿＿] ✖ 🔑 76

If $\lim\limits_{x\to 5} \dfrac{f(x-5)+x-1}{x-5}=15$, then $\lim\limits_{x\to 0} f(x)=$

- ○ 🔑 -4
- ○ 5
- ○ -5
- ○ 6
- ○ 10

✖

A particle is moving along a straight line with equation of motion $s=f(t)=100+\dfrac{1}{t+1}$, where s is measured in meters and t in seconds. Find the velocity of the particle when $t=4$. (If the answer is a fraction, write it as a fraction in the simplest form).

The answer is [   ] ✗ $-\dfrac{1}{25}$

If $A = \lim\limits_{x\to 0^-} \dfrac{\llbracket x-1 \rrbracket}{x-1}$ and $B= \lim\limits_{x\to 0^+} \dfrac{\llbracket x-1 \rrbracket}{x-1}$ where $\llbracket x-1 \rrbracket$ is the greatest integer function of x , then $70A-B=$

[   ] ✗ 🔑 139

Find the value of the limit if it exists. If it is $\pm\infty$, write $\pm\infty$, and if does not exist, just write DNE.

$\lim\limits_{x\to\infty} \left(10 + \dfrac{1}{x+2} e^{\sin x} \right) =$ [   ] ✗ 10