(6) The function $f(x)=\begin{cases}4x-1 & if \quad x>1\\ 5x-2 & if \quad x\le 1\end{cases}$ is continuous at $x=1$.

A) True

B) False

(7) $\lim_{x\to 0}\frac{\sqrt{4+x}-2}{x}=$.........

A) 1

B) 0

C) $\frac{1}{4}$

D) ∞

(8) The equation of the tangent to the curve $y=\frac{1}{x^2-2}$ at $(1,-1)$ is ……

A) $y+2x+3=0$

B) $2y-x+3=0$

C) $y+2x-1=0$

D) $2y-x+1=0$

(9) $\lim_{x\to -3}\frac{x^2+4x+3}{x^2+5x+6}=$.........

A) $\frac{4}{5}$

B) 2

C) 0

D) D.N.E

(10) The function of $f(x)=\sqrt{3x-1}$ is continuous on

A) $\left(-\infty,-\frac{1}{3}\right]\cup\left[\frac{1}{3},\infty\right)$

B) $\left[\frac{1}{3},\infty\right)$

C) $\left[-\frac{1}{3},\frac{1}{3}\right]$

D) $\left(-\infty,\frac{1}{3}\right]$

(11) $\lim_{x\to 4}(10x-x^2-4)=$......

A) 20

B) 40

C) −20

D) D.N.E

(12) $\lim_{x \to 2^-} \frac{x^2-4}{|x-2|} = \dots\dots\dots$

A) 0	C) -4
B) -1	D) 4

(13) If $f(x) = \frac{1}{x^3-8}$, then $f'(x) = \dots\dots\dots$

A) $\frac{3x^2}{(x^3-8)^2}$	C) $\frac{3x^2}{(x^2-8)^3}$
B) $\frac{-3x^2}{(x^2-8)^3}$	D) $\frac{-3x^2}{(x^3-8)^2}$

(14) The derivative of $f(x) = \sqrt{x^3}$ by using definition is

A) $\lim_{h \to 0} \frac{\sqrt{(x-h)^3} + \sqrt{x^3}}{h}$	C) $\lim_{h \to 0} \frac{\sqrt{(x+h)^3} + \sqrt{x^3}}{h}$
B) $\lim_{h \to 0} \frac{\sqrt{(x-h)^3} - \sqrt{x^3}}{h}$	D) $\lim_{h \to 0} \frac{\sqrt{(x+h)^3} - \sqrt{x^3}}{h}$

(15) $\frac{d}{dx}\left(\frac{x^3+x+1}{x^4}\right) = \dots\dots\dots$

A) $\frac{1}{x^2} + \frac{3}{x^4} + \frac{4}{x^5}$	C) $\frac{1}{x^2} - \frac{3}{x^4} + \frac{4}{x^5}$
B) $-\frac{1}{x^2} + \frac{3}{x^4} - \frac{4}{x^5}$	D) $-\frac{1}{x^2} - \frac{3}{x^4} - \frac{4}{x^5}$

(16) $\lim_{x \to 3} \frac{x-2}{x^2-9} = \dots\dots$

A) DNE	C) $-\infty$
B) $+\infty$	D) 0

(17) $\lim_{t \to -\infty} \frac{1-t}{\sqrt{4t^2+1}} = \dots\dots\dots$

A) $\frac{1}{4}$	C) $-\frac{1}{2}$
B) $\frac{1}{2}$	D) $-\frac{1}{4}$

(18) The function of $K(x)=\frac{x-6}{x^2-4}$ is continuous on …..	
A) $(-\infty,-2)$	C) $\mathbb{R}-\{-2,2\}$
B) $(2,\infty)$	D) $(-2,2)$

(19) The value of k that makes $f(x)=\begin{cases} k+3x & if \quad x\geq 2 \\ 2x-k & if \quad x<2 \end{cases}$ continuous at x=2 is ……	
A) -1	C) 5
B) 1	D) 2

(20) $\lim_{x\to 2}\frac{x^3+2x-4}{4x}=$……..	
A) 4	C) 1
B) 0	D) $\frac{1}{4}$

(21) The equation of the normal to the curve $y=\frac{x-1}{x+1}$ at $(-2,3)$ is	
A) $2y-x+4=0$	C) $2y+x-4=0$
B) $y+2x+7=0$	D) $y-2x-7=0$

(22) The continuous extension of $f(x)=\frac{x^3-x^2}{x^3-1}$ to $x=1$ is…………	
A) $F(x)=\begin{cases} \frac{x^3-x^2}{x^3-1} & if \quad x\neq 1 \\ 1 & if \quad x=1 \end{cases}$	C) $F(x)=\begin{cases} \frac{x^3-x^2}{x^3-1} & if \quad x\neq 1 \\ -1 & if \quad x=1 \end{cases}$
B) $F(x)=\begin{cases} \frac{x^3-x^2}{x^3-1} & if \quad x\neq 1 \\ -\frac{1}{3} & if \quad x=1 \end{cases}$	D) $F(x)=\begin{cases} \frac{x^3-x^2}{x^3-1} & if \quad x\neq 1 \\ \frac{1}{3} & if \quad x=1 \end{cases}$

(23) $\lim_{x\to\infty}\frac{3x^2+2x-3}{2x-x^2}=$………	
A) 0	C) 3
B) -3	D) ∞

(24) $\lim_{x\to-\infty}\frac{x^4-3x^2+x}{x^3-x+2}=$………	
A) $-\infty$	C) ∞
B) 0	D) 1

University of Jeddah
Faculty of Science
Department of Mathematics
Course Code: MATH 110

جامعة جدة
University of Jeddah

Academic Term: First 1438/1439 H
Exam: Second Exam
Exam Time: 90 Minutes

Student Name: زياد سعيد أحمد الفقيه	**C**
ID: 1845333	

(1) If $\lim_{x\to 3} f(x) = 2$ and $\lim_{x\to 3} g(x) = -5$, then $\lim_{x\to 3} \frac{g(x)+3}{3f(x)-2} = \ldots\ldots$

A) -2	C) 2
B) $-\frac{1}{2}$	D) $\frac{1}{2}$

(2) $\frac{d}{dx}\left(\frac{2+3x}{2-3x}\right)_{x=1} = \ldots\ldots$

A) 12	C) 18
B) -12	D) -18

(3) $\lim_{x\to -\infty} \frac{2x^2-1}{x^3-8} = \ldots\ldots$

A) 2	C) -2
B) 0	D) $-\infty$

(4) If $3x \le h(x) \le x^2+2$, then $\lim_{x\to 2} h(x) = \ldots\ldots$

A) 0	C) -6
B) D.N.E	D) 6

(5) If $f(x) = 5x^{\frac{1}{5}} + x^{-2} - 10$, then $f'(x) = \ldots\ldots$

A) $5x^{\frac{-4}{5}} - 2x^{-3}$	C) $x^{\frac{-4}{5}} + 2x^{-3}$
B) $x^{\frac{-4}{5}} - 2x^{-3}$	D) $5x^{\frac{-4}{5}} + 2x^{-3}$

(20) The function f [illegible] is continuous on [illegible]

A [illegible] B [illegible] C [illegible] D [illegible]

(21) lim [illegible]

A [illegible] B [illegible] C [illegible] D [illegible]

(22) The value of [illegible] that makes f(x) = [illegible] continuous at x = [illegible]

A [illegible] B [illegible] C [illegible] D [illegible]

(23) If f [illegible] then lim [illegible]

A [illegible] B [illegible] C [illegible] D [illegible]

(24) lim [illegible]

A [illegible] B [illegible] C [illegible] D [illegible]

(25) lim [illegible]

A [illegible] B [illegible] C [illegible] D [illegible]

(Best Wishes)

(21) The function $h(x) = \begin{cases} \frac{|x-1|}{x-1}, & x \neq 1 \\ 1, & x = 1 \end{cases}$ is

Ⓐ continuous at $x = 1$	Ⓒ neither left nor right continuous at $x = 1$
Ⓑ left continuous at $x = 1$ only	Ⓓ right continuous at $x = 1$ only

(22) The derivative of the function $f(x) = x^2$ by using the definition is

Ⓐ $\lim_{h \to 0} \frac{(x+h)^2 + x^2}{h}$	Ⓒ $\lim_{h \to 0} \frac{(x-h)^2 + x^2}{h}$
Ⓑ $\lim_{h \to 0} \frac{(x+h)^2 - x^2}{h}$	Ⓓ $\lim_{h \to 0} \frac{(x-h)^2 - x^2}{h}$

(23) The function $f(x) = \frac{x^2+9}{x^2-2x-24}$ is continuous on

Ⓐ $R - \{-6, -4\}$	Ⓑ $R - \{-6, 4\}$	Ⓒ $R - \{-4, 6\}$	Ⓓ $R - \{4, 6\}$

(24) The function $f(x) = \begin{cases} 4 - x^2, & x > -2 \\ 4 - 3x, & x \leq -2 \end{cases}$ is

Ⓐ left continuous at $x = -2$ only	Ⓒ continuous at $x = -2$
Ⓑ neither left nor right continuous at $x = -2$	Ⓓ right continuous at $x = -2$ only

(25) If $y = x(1+3x)(1-4x)$ then $\frac{dy}{dx}$ at [illegible]

Ⓐ $1 + 24x$	Ⓑ $-1 - 24x$	Ⓒ $1 - 24x$	Ⓓ $-1 + 24x$

(Best Wishes)

(6) If $y = x^5 + x^6 - 11$ then $y' =$

Ⓐ $5x^4 + 6x^5 + 11$	Ⓑ $5x^5 + 6x^5$	Ⓒ $5x^4 + 6x^5$	Ⓓ $5x^4 + 6x^6$

(7) If $y = \frac{1}{2 - x^6}$ then $\frac{dy}{dx} =$

Ⓐ $\frac{6x^5}{(2-x^6)^2}$	Ⓑ $-\frac{6x^5}{(2-x^6)^2}$	Ⓒ $-\frac{6x^5}{(2-x^6)^2}$	Ⓓ $\frac{6x^5}{(2-x^6)^2}$

(8) The function $h(x) = \begin{cases} 4-3x, & x \geq -3 \\ 4-x^2, & x < -3 \end{cases}$ is

Ⓐ left continuous at $x = -3$ only	Ⓒ continuous at $x = -3$
Ⓑ neither left nor right continuous at $x = -3$	Ⓓ right continuous at $x = -3$ only

(9) The derivative of the function $f(x) = \sqrt[3]{x}$ by using the definition is

Ⓐ $\lim_{h \to 0} \frac{\sqrt[3]{x-h} - \sqrt[3]{x}}{h}$	Ⓒ $\lim_{h \to 0} \frac{\sqrt[3]{x+h} - \sqrt[3]{x}}{h}$
Ⓑ $\lim_{h \to 0} \frac{\sqrt[3]{x-h} - \sqrt[3]{x}}{h}$	Ⓓ $\lim_{h \to 0} \frac{\sqrt[3]{x-h} + \sqrt[3]{x}}{h}$

(10) The equation of the tangent line to the curve $y = x^3 - 2$ at the point $(1, -1)$ is

Ⓐ $y = 3x + 4$	Ⓑ $3y = -x + 2$	Ⓒ $3y = -x - 2$	Ⓓ $y = 3x - 4$

(11) The equation of the normal to the curve $y = x^3 - 2$ at the point $(1, -1)$ is

Ⓐ $3y = -x - 2$	Ⓑ $y = 3x - 4$	Ⓒ $y = 3x + 4$	Ⓓ $3y = -x + 2$

(12) $\lim_{x \to 0} \frac{\sqrt{x+6} - \sqrt{6}}{x} =$

Ⓐ $\frac{1}{12}$	Ⓑ $\frac{1}{2\sqrt{6}}$	Ⓒ $\frac{1}{\sqrt{6}}$	Ⓓ $\frac{1}{6}$

Course Code: MATH 101

D

Student Name:
ID:

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(1) If $u=(1-3t)(1+4t)$ then $\frac{du}{dt}=$

Ⓐ $1+24t$	Ⓑ $-1-24t$	Ⓒ $1-24t$	Ⓓ $-1+24t$

(2) If $f(x)=\begin{cases} 3x-7 & x>2 \\ 6-2x & x<2 \end{cases}$, then $\lim_{x\to 2} f(x)=$

Ⓐ -1	Ⓑ 1	Ⓒ does not exist	Ⓓ 2

(3) The function $f(x)=\frac{x^2+5}{x^2+2x-24}$ is continuous on

Ⓐ $\mathbb{R}-\{-6,-4\}$	Ⓑ $\mathbb{R}-\{-6,4\}$	Ⓒ $\mathbb{R}-\{-4,6\}$	Ⓓ $\mathbb{R}-\{4,6\}$

(4) If $\lim_{x\to -1} f(x)=4$, $\lim_{x\to -1} g(x)=-1$, then $\lim_{x\to -1}\frac{xf(x)}{x^2-g(x)}=$

Ⓐ 2	Ⓑ -1	Ⓒ 1	Ⓓ -2

(5) $\lim_{x\to -4}\frac{x+4}{x^2+x-12}=$

Ⓐ $-\frac{1}{7}$	Ⓑ 1	Ⓒ -1	Ⓓ $\frac{1}{7}$

(13) $\lim\limits_{x \to [illegible]} \frac{6-3x^2}{x^2+5} =$

(A) -1	(B) 0	(C) [illegible]	(D) $-\infty$

(14) $\lim\limits_{x \to [illegible]} \frac{4x^2+2x-11}{5x^2-3x-5} =$

(A) $\frac{4}{5}$	(B) 0	(C) [illegible]	(D) ∞

(15) If [illegible] $\le f(x) \le$ [illegible], then $\lim\limits_{x \to 1} f(x) =$

(A) 0	(B) 2	(C) [illegible]	(D) -1

(16) The function $f(x) = \begin{cases} \frac{|x+1|}{x+1}, & x \ne -1 \\ -2, & x = -1 \end{cases}$ is

(A) neither left nor right continuous at $x=-1$	(C) right continuous at $x=-1$ only
(B) continuous at $x=-1$	(D) left continuous at $x=-1$ only

(17) $\lim\limits_{x \to \infty} \frac{3x+[illegible]}{\sqrt{25x^2+4}} =$

(A) $-\frac{1}{5}$	(B) $\frac{1}{5}$	(C) [illegible]	(D) [illegible]

(18) $\lim\limits_{x \to -\infty} \frac{3x+[illegible]}{\sqrt{25x^2+4}} =$

(A) $-\frac{3}{5}$	(B) $\frac{3}{5}$	(C) [illegible]	(D) [illegible]

(19) $\lim\limits_{x \to [illegible]} \frac{[illegible]}{x-[illegible]} =$

(A) $-\infty$	(B) [illegible]	(C) [illegible]	(D) [illegible]

(20) If $f(x) =$ [illegible], then $f'(1) =$

Ⓐ -4	Ⓑ [illegible]	Ⓒ [illegible]	Ⓓ -2

(21) If $y = \frac{2-x}{2+3x}$, then $\frac{dy}{dx} =$

Ⓐ $\frac{12}{(2+3x)}$	Ⓑ $\frac{12}{(2+3x)^2}$	Ⓒ [illegible]	Ⓓ [illegible]

(22) $\lim \frac{x^2 + [illegible]}{x+1} =$

Ⓐ 10	Ⓑ 0	Ⓒ [illegible]	Ⓓ [illegible]

(23) The continuous extension of the function $f(x) = \frac{x+2}{x^3+8}$ at $x = -2$

Ⓐ $h(x) = \begin{cases} \frac{x+2}{x^3+8}, & x \neq -2 \\ 1, & x = -2 \end{cases}$

Ⓑ $h(x) = \begin{cases} \frac{x+2}{x^3+8}, & x \neq -2 \\ 1/12, & x = -2 \end{cases}$

Ⓒ $h(x) = \begin{cases} \frac{x+2}{x^3+8}, & x \neq -2 \\ 1/8, & x = -2 \end{cases}$

Ⓓ $h(x) = \begin{cases} \frac{x+2}{x^3+8}, & x \neq -2 \\ 3/4, & x = -2 \end{cases}$

(24) $\lim_{x \to -3} \lfloor x \rfloor =$

Ⓐ does not exist	Ⓑ -3	Ⓒ -2	Ⓓ -4

(25) The value of k that makes $f(x) = \begin{cases} kx - 4 & x > -1 \\ k - 2x & x \leq -1 \end{cases}$ continuous at $x = -1$ is

Ⓐ [illegible]	Ⓑ 3	Ⓒ -3	Ⓓ 2

If $y = $ [illegible], Find $y'' =$

Ⓐ [illegible]	Ⓑ [illegible]	Ⓒ [illegible]	Ⓓ [illegible]

If [illegible] $= \frac{1}{2 - x^2}$, then $\frac{dy}{dx} =$

Ⓐ [illegible]	Ⓑ [illegible]	Ⓒ [illegible]	Ⓓ [illegible]

The function $f(x) = $ [illegible] is

Ⓐ left continuous at $x = -3$ only	Ⓑ continuous at $x = -3$
Ⓒ neither left nor right continuous at $x = -3$	Ⓓ right continuous at $x = -3$ only

The derivative of the function [illegible] by using the definition is

Ⓐ [illegible]	Ⓑ [illegible]
Ⓒ [illegible]	Ⓓ [illegible]

The equation of the tangent line to the curve [illegible] at the point [illegible] is

Ⓐ [illegible]	Ⓑ [illegible]	Ⓒ [illegible]	Ⓓ [illegible]

The equation of the normal to the curve [illegible] at the point [illegible] is

Ⓐ [illegible]	Ⓑ [illegible]	Ⓒ [illegible]	Ⓓ [illegible]

$\lim$ [illegible] $=$

Ⓐ [illegible]	Ⓑ [illegible]	Ⓒ [illegible]	Ⓓ [illegible]

University of Jeddah
Faculty of Science
Department of Mathematics

Academic Term: Second 1438/1439 H
Exam: Second Exam
Exam Time: 90 Minutes
Course Code: MATH 101

B

Student Name:
ID:

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([illegible]) The continuous extension of the function $g(x)=\frac{x+1}{x^2-1}$ at $x=-1$ is

Ⓐ $g(x)=\begin{cases}\frac{x+1}{x^2-1}, & x\neq -1\\ 1/2, & x=-1\end{cases}$	Ⓒ $g(x)=\begin{cases}\frac{x+1}{x^2-1}, & x\neq -1\\ -1, & x=-1\end{cases}$
Ⓑ $g(x)=\begin{cases}\frac{x+1}{x^2-1}, & x\neq -1\\ 1, & x=-1\end{cases}$	Ⓓ $g(x)=\begin{cases}\frac{x+1}{x^2-1}, & x\neq -1\\ 1/2, & x=-1\end{cases}$

([illegible]) The function $f(x)=\begin{cases}\frac{|x+1|}{x+1}, & x\neq -1\\ -1, & x=-1\end{cases}$ is

Ⓐ continuous at $x=-1$	Ⓒ left continuous at $x=-1$ only
Ⓑ neither left nor right continuous at $x=-1$	Ⓓ right continuous at $x=-1$ only

([illegible]) If $y=[illegible]$ then $y''=$

Ⓐ [illegible]	Ⓑ [illegible]	Ⓒ [illegible]	Ⓓ [illegible]

([illegible]) The function $f(x)=\begin{cases}3-2x, & x\leq -2\\ 1-x^2, & x>-2\end{cases}$ is

Ⓐ continuous at $x=-2$	Ⓒ left continuous at $x=-2$ only
Ⓑ right continuous at $x=-2$ only	Ⓓ neither left nor right continuous at $x=-2$