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

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

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

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

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

A) 2	C) $\frac{2}{3}$
B) 0	D) $-\infty$

(4) If $3x \le h(x) \le x^2+2$, then $\lim_{x\to 1} h(x) =$ .....

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

(5) If $f(x) = 5x^{\frac{1}{3}} + x^{-2} - 10$, then $f'(x) =$ .....

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

(6) The function $f(x)=\begin{cases}4x-1 & \text{if } x>1\\ 5x-2 & \text{if } x\le 1\end{cases}$ 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) $\lim_{x \to 2} \frac{x^2 - 4}{|x - 2|} =$ .....

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

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

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

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

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

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

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

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

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

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

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

(18) The function of $K(x)=\frac{x-6}{x^2-4}$ is continuous on .....

A) $(-\infty,-2)$
B) $(2,\infty)$
C) $\mathbf{R}-\{-2,2\}$
D) $(-2,2)$

(19) The value of k that makes $f(x)=\begin{cases} k+3x & \text{if } x\geq 2 \\ 2x-k & \text{if } x<2 \end{cases}$ continuous at $x=2$ is .....

A) -1
B) 1
C) 5
D) 2

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

A) 4
B) 0
C) 1
D) $\frac{1}{4}$

(21) The equation of the normal to the curve $y=\frac{x-1}{x+1}$ at $(-2,3)$ is

A) $2y-x+4=0$
B) $y+2x+7=0$
C) $2y+x-4=0$
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) $F(x)=\begin{cases} \frac{x^3-x^2}{x^3-1} & \text{if } x\neq 1 \\ 1 & \text{if } x=1 \end{cases}$

B) $F(x)=\begin{cases} \frac{x^3-x^2}{x^3-1} & \text{if } x\neq 1 \\ -\frac{1}{3} & \text{if } x=1 \end{cases}$

C) $F(x)=\begin{cases} \frac{x^3-x^2}{x^3-1} & \text{if } x\neq 1 \\ -1 & \text{if } x=1 \end{cases}$

D) $F(x)=\begin{cases} \frac{x^3-x^2}{x^3-1} & \text{if } x\neq 1 \\ \frac{1}{3} & \text{if } x=1 \end{cases}$

(23) $\lim_{x\to\infty}\frac{3x^2+2x-3}{2x-x^2}=$.....

A) 0
B) -3
C) 3
D) ∞

(24) $\lim_{x\to-\infty}\frac{x^4-3x^2+x}{x^3-x+2}=$.....

A) $-\infty$
B) 0
C) ∞
D) 1

D

Student Name:

ID:

"لا يسمح باستخدام الآلة الحاسبة"

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

(A) $1+24v$	(B) $-1-24v$	(C) $1-24v$	(D) $-1+24v$

(2) If $f(x)=\begin{cases} 5x-7 & x>2 \\ 6-2x & x<2 \end{cases}$, then $\lim_{x\to 2} f(x)=$

(A) -1	(B) 1	(C) does not exist	(D) 2

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

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

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

(A) 2	(B) -1	(C) 1	(D) -2

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

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

(6) If $y = x^3 + x^2 - 11$ then $y' =$

(A) $3x^3 + 3x^2 + 11$	(B) $3x^3 + 3x^2$	(C) $3x^2 + 2x^2$	(D) $3x^3 + 2x^2$

(7) If $y = \frac{1}{2-x^3}$ then $\frac{dy}{dx} =$

(A) $\frac{3x^2}{(2-x^3)^2}$	(B) $\frac{3x^2}{(2-x^3)}$	(C) $\frac{6x^2}{(2-x^3)}$	(D) $\frac{6x^2}{(2-x^3)^2}$

(8) The function $h(x) = \begin{cases} 6-3x, & x \geq -3 \\ 4-x^2, & x < -3 \end{cases}$

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

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

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

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

(A) $y = 2x + 4$	(B) $2y + x = 1$	(C) $2y = x - 2$	(D) $y = 2x - 4$

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

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

(12) $\lim_{x \to 0} \frac{\sqrt{x+9} - \sqrt{9}}{x}$

(A) $\frac{1}{12}$	(B) $\frac{1}{\sqrt{18}}$	(C) $\frac{1}{\sqrt{9}}$	(D) $\frac{1}{6}$

(24) $\lfloor -4.3 \rfloor =$

(a) -4.3 (b) -5

(c) 4.3 (d) -4

(25) Range of the function $f(x) = \lfloor x \rfloor$ is

(a) the real numbers. (b) the natural numbers.

(c) the rational numbers. (d) the integer numbers.

(26) $\frac{5\pi}{3} =$

(a) 120° (b) 240°

(c) 300° (d) 420°

(27) If the radius of a circle is 1cm, what angle is subtended by an arc of 2cm?

(a) 2 rad. (b) 3 rad.

(c) 4 rad. (d) 5 rad.

(28) $\sec(30^\circ) \times \tan(135^\circ) =$

(a) $\frac{-\sqrt{3}}{2}$ (b) $\frac{\sqrt{3}}{2}$

(c) $\frac{-2}{\sqrt{3}}$ (d) $\frac{2}{\sqrt{3}}$

(29) $2 \times \sin(25^\circ) \times \cos(25^\circ) =$

(a) $\sin(100^\circ)$ (b) $\sin(50^\circ)$

(c) $\cos(100^\circ)$ (d) $\cos(50^\circ)$

(30) Range of the trigonometric function $\sin(\theta)$ is

(a) $[-1, 1]$ (b) $[0, \infty)$

(c) $(0, 1)$ (d) $(-\infty, \infty)$