King Abdulaziz University

Rabigh College of Science and Arts

Department of Mathematics

Second Exam – Math110

Date: 12/3/1438

Time: 90 minutes

Name……………………………………ID:………......................... **A**

Choose the correct answer of the following questions:

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

(a)3	(b)13	(c)-11	(d)-3

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

(a) 4	(b) -2	(c) 2	(d) 1

(3)	$\lim_{x\to 0}\frac{\sqrt{x+25}-5}{x}=$

(a) 10	(b) -10	(c) $\frac{1}{10}$	(d)- $\frac{1}{10}$

(4)	If $\lim_{x\to 1}f(x)=3$, $\lim_{x\to 1}g(x)=-4$, $\lim_{x\to 1}h(x)=-1$, then $\lim_{x\to 1}[2f(x)g(x)h(x)]=$

(a) -24	(b) 48	(c) 12	(d) 24

(5)	If $f(x)=\begin{cases}2x+3 & ; x\geq -2\\ 2x+5 & ; x<-2\end{cases}$, then $\lim_{x\to -2}f(x)=$

(a) 3	(b) -1	(c) 1	(d) Does not exist

(6)	The function $f(x)=\begin{cases}\frac{x^2-9}{x-3} & \text{if } x\neq 3\\ 1 & \text{if } x=3\end{cases}$ is continuous at $x=3$

(a) True	(b)False

(7)	$\lim_{x\to \infty}\frac{\sqrt{4x^2+1}}{x}=$

(a) -4	(b) 4	(c) 3	(d)2

(8)	$\lim_{x \to \infty}\left(\sqrt{x^2+1}-x\right)=$			
	(a) 4	(b) 0	(c) -2	(d) 2

(9)	The vertical asymptotes of the graph of the function $y=\frac{3}{x-2}$ is			
	(a)x=0	(b)y=0	(c)x=2	(d)y=2

(10)	The horizontal asymptotes of the graph of the function $y=\frac{3}{x-2}$ is			
	(a)x=0	(b)y=0	(c)x=2	(d)y=2

(11)	Any rational function is continues on $\mathbb{R}=(-\infty,\infty)$.	
	(a) True	(b) False

(12)	$\lim_{x \to 0}\frac{\sin(5x)}{7x}=$			
	(a) 5	(b) 7	(c) $\frac{5}{7}$	(d) $\frac{7}{5}$

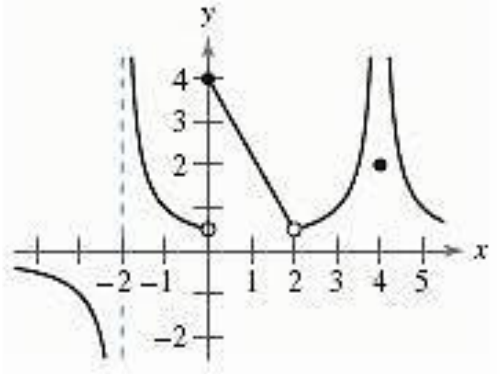
(13)	An equation for tangent line to $f(x)=\frac{2}{x^2+1}$ at the point (1,1) is			
	(a) $y=-x+2$	(b) $y=x$	(c) $y=2x-1$	(d) $y=-2x+3$

(14)	If $f(x)=xe^x$, then the nth derivative, $f^{(n)}(x)=$			
	(a) $e^x(x+n)$	(b) $e^x(x+1)$	(c) $e^x(x-n)$	(d) $e^x(x-1)$

(15)	$f(x)=\begin{cases} x & \text{if } x<-1 \\ -1 & \text{if } x=-1 \\ \frac{x+1}{x^2-1} & \text{if } x>-1 \end{cases}$,then $\lim_{x \to -1^+}(f)=$			
	(a) $\frac{1}{2}$	(b) $-\frac{1}{2}$	(c) 0	(d) $-\frac{3}{2}$

(16)	$y=\pi^2$ then $\acute{y}=$			
	(a) π	(b) 2π	(c) 1	(d) 0

In [17-20] Consider the following graph of the function $f(x)$ then



(17)	$\lim_{x\to 0^+} f(x) =$			
	(a) 1	(b) 0	(c) 4	(d) Doesn't exist

(18)	$f(4) =$			
	(a) 1	(b) 0	(c) 2	(d) Doesn't exist

(19)	The function f is discontinuous at the point x=0, because:	
	(a) $f(0)$ doesn't exist	(b) $\lim_{x\to 0} f(x) \neq f(0)$
	(c) $\lim_{x\to 0^-} f(x) \neq \lim_{x\to 0^+} f(x)$	(d) Not of the above

(20)	The function f is continuous at x=2	
	(a)True	(b)False

(21)	$\lim_{x\to 3} \frac{x^2-3}{x} =$			
	(a) 0	(b) 2	(c) 16	(d) 5

(22)	If $f(x) = e^x - 2x^3 + 4x$ then $f''(x) =$			
	(a) $e^x - 6x^2 + 4$	(b) $e^x - 12x + 4$	(c) $e^x - 12x$	(d) 0

(23)	If $y = \frac{e^x}{1+x}$ then $\frac{dy}{dx} =$			
	(a) $\frac{x}{(1+x)^2}$	(b) $\frac{e^x}{(1+x)^2}$	(c) $\frac{1}{(1+x)^2}$	(d) $\frac{x e^x}{(1+x)^2}$

(24)	For what value of the constant c is the function f continuous on $(-\infty,+\infty)$ $$f(x)=\begin{cases} cx^2+2x & if \quad x<2 \\ x^3-cx & if \quad x\geq 2 \end{cases}$$			
	(a) 3	(b) 2	(c) $\frac{2}{3}$	(d) $\frac{3}{2}$

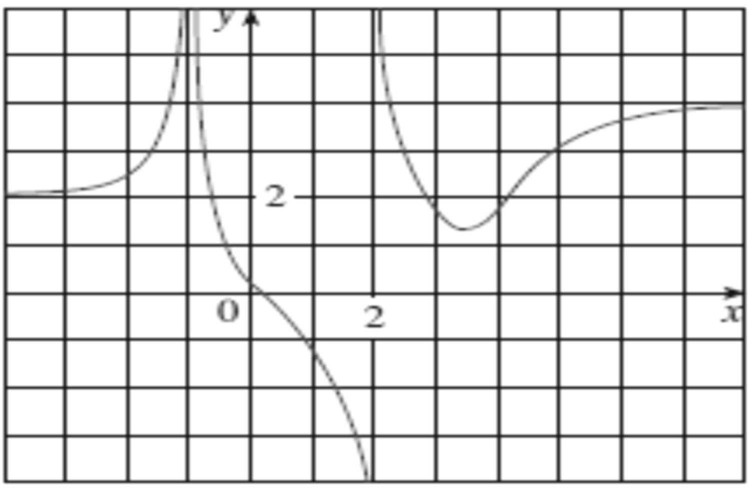
(25)	$\lim\limits_{\theta\to 0}\dfrac{\cos\theta-1}{\theta}=1$	
	(a)True	(b) False

(26)	If $y=\sqrt{x}(2x+5)$, then y'			
	(a) $2\sqrt{x}+\frac{2x+5}{\sqrt{x}}$	(b) $2\sqrt{x}+\frac{2x+5}{2\sqrt{x}}$	(c) $2\sqrt{x}+\frac{x+5}{\sqrt{x}}$	(d) $\sqrt{x}+\frac{2x+5}{2\sqrt{x}}$

(27)	The derivative $f'(x)$ for the function $f(x)=\sin x-\frac{1}{2}\cot x$ is			
	(a) $\cos x-\frac{1}{2}\cot x$	(b) $\sin x+\frac{1}{2}\csc^2 x$	(c) $\cos x+\frac{1}{2}\csc^2 x$	(d) $\cos x-\frac{1}{2}\csc^2 x$

(28)	$\lim\limits_{x\to a}\sqrt[n]{f(x)}=\sqrt{\lim\limits_{x\to a}f(x)}$	
	(a)True	(b)False

In [29-30] Consider the following graph of the function $f(x)$ then



(29)	The function f has horizontal asymptotes at			
	(a)) x=-2, x=-4	(b)x=2, x=4	(c) y=-2, y=-4	(d)y=2, y=4

(30)	The function f has vertical asymptotes at			
	(a)x=2,x=-1	(b)y=2,y=-1	(c)x=-2,x=1	(d) y=-2,y=1