King Abdulaziz University
Rabigh College of Science and Arts
Department of Mathematics

Second Exam – Math110
Date: 26/7/1439
Time: 90 minutes

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

Choose the correct answer of the following questions:

(1)	$\lim_{x\to 1}(x^3-2x+10)=$			
	(a) 3	(b) 13	(c) 10	(d) 9

(2)	$\lim_{x\to 3}\frac{x^2-9}{x^2-2x-3}=$			
	(a) $\frac{3}{2}$	(b) $\frac{2}{3}$	(c) 2	(d) 1

(3)	$\lim_{x\to 7}\frac{\sqrt{x+2}-3}{x-7}=$			
	(a) $\frac{1}{2}$	(b) $\frac{1}{6}$	(c) 6	(d) 2

(4)	If $\lim_{x\to 1}f(x)=3$, $\lim_{x\to 1}g(x)=-2$, $\lim_{x\to 1}h(x)=1$, then $\lim_{x\to 1}[2f(x)g(x)h(x)]=$			
	(a) -24	(b) 24	(c) 12	(d) -12

(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)	$\lim_{x\to\infty}\frac{x+x^3+x^5}{1-x^2+x^4}=$			
	(a) ∞	(b) 4	(c) 3	(d) 0

(8)	$\lim_{x\to\infty}\frac{\sqrt{4x^2+1}}{x}=$			
	(a) -4	(b) 4	(c) 3	(d) 2

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

(10)	The vertical asymptote of the graph of the function $y=\frac{3x+1}{x-2}$ is			
	(a) $x=3$	(b) $y=3$	(c) $x=2$	(d) $y=2$

(11)	The horizontal asymptote of the graph of the function $y=\frac{3x+1}{x-2}$ is			
	(a) $x=3$	(b) $y=3$	(c) $x=2$	(d) $y=2$

(12)	Any polynomial function is continuous on $\mathbb{R}=(-\infty,\infty)$.	
	(a) True	(b) False

(13)	$\lim_{x\to0}\frac{\sin(9x)}{5x}=$			
	(a) 0	(b) 1	(c) $\frac{9}{5}$	(d) $\frac{5}{9}$

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

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

(16)	If $y=\sqrt{30}$ then $y'=$			
	(a) $\sqrt{30}$	(b) $\frac{1}{2\sqrt{30}}$	(c) 1	(d) 0

(17)	If $\lim_{x\to 3}\left(\frac{f(x)-2}{x^2}\right)=2$, then $\lim_{x\to 3} f(x)=$			
	(a) 0	(b) 20	(c) 16	(d) 5

(18)	If $f(x)=\sin x-2x^3+4x$ then $f''(x)=$			
	(a) $\sin x+12x$	(b) $-(\cos x+12x)$	(c) $-(\sin x+12x)$	(d) 0

(19)	If $y=\frac{\sec x}{1+\sec x}$ then $\frac{dy}{dx}=$			
	(a) $\frac{\sec x}{(1+\sec x)^2}$	(b) $-\frac{\sec x\tan x}{1+\sec x}$	(c) $\frac{\tan x}{(1+\sec x)^2}$	(d) $\frac{\sec x\tan x}{(1+\sec x)^2}$

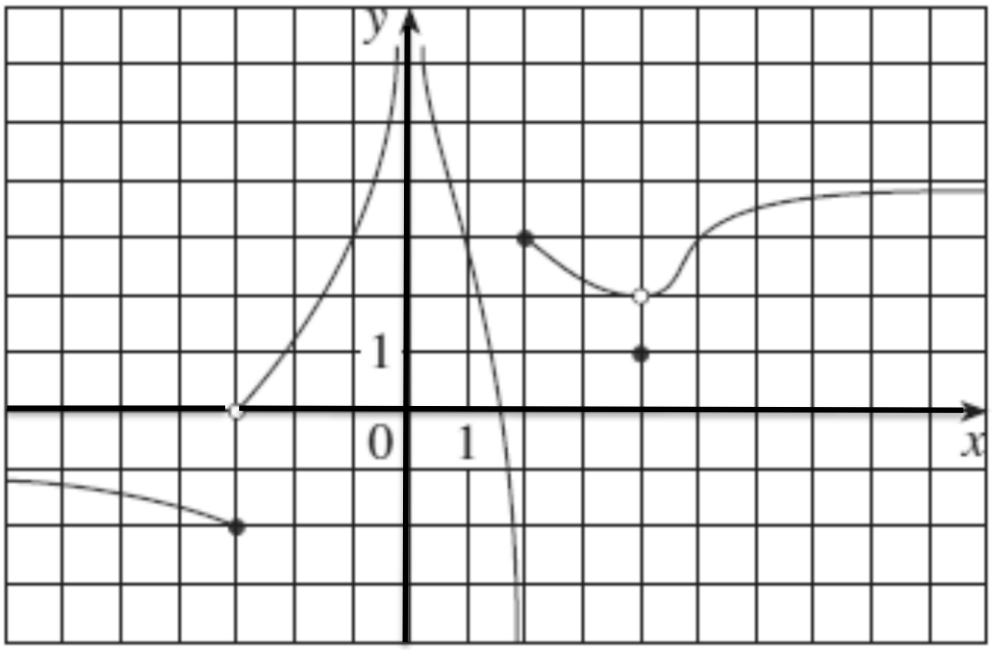
(20)	For what value of the constant c is the function f continuous on $(-\infty,\infty)$ $f(x)=\begin{cases}cx^2+2x & \text{if } x<2\\ x^3-cx & \text{if } x\geq 2\end{cases}$			
	(a) 3	(b) 2	(c) $\frac{2}{3}$	(d) $\frac{3}{2}$

(21)	$\lim_{\theta\to 0}\frac{\cos\theta-1}{\theta}=0$	
	(a) True	(b) False

(22)	If $y=e^x\cos x$ then $y'=$			
	(a) $\cos x-\sin x$	(b) $e^x(\sin x-\cos x)$	(c) $e^x(\cos x+\sin x)$	(d) $e^x(\cos x-\sin x)$

(23)	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) $\cos x-\frac{1}{2}\csc^2 x$

In [24-30] consider the following graph of the function $f(x)$ then



(24)	The function f has horizontal asymptotes at			
	(a) $x=-4,\ x=1$	(b) $x=4,\ x=-1$	(c) $y=-4,\ y=1$	(d) $y=4,\ y=-1$

(25)	The function f has vertical asymptotes at			
	(a) $x=0,\ x=2$	(b) $y=0,\ y=2$	(c) $x=-2,\ x=1$	(d) $y=2,\ y=-1$

(26)	$\lim_{x\to 2^+} f(x) =$			
	(a) 1	(b) 0	(c) 3	(d) Doesn't exist

(27)	$\lim_{x\to -3} f(x) =$			
	(a) 1	(b) 0	(c) 3	(d) Doesn't exist

(28)	$f(4) =$			
	(a) 3	(b) 0	(c) 1	(d) 4

(29)	The function f is discontinuous at the point $x=4$ because:	
	(a) $f(4)$ doesn't exist	(b) $\lim_{x\to 4} f(x) \neq f(4)$
	(c) $\lim_{x\to 4^-} f(x) \neq \lim_{x\to 4^+} f(x)$	(d) Not of the above

(30)	The function f is continuous at $x=-3$.	
	(a) True	(b) False