King Abdulaziz University Rabigh College of Science and Arts Department of Mathematics	Second Exam – Math110 Date: 19/3/1439 Time: 90 minutes

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

Choose the correct answer of the following questions:

(1) $\lim_{x\to 2}\frac{2x^2+4}{x^2+6x-4}=$

(a) 1	(b) 2	(c) 3	(d) 4

(2) $\lim_{x\to 4}\frac{x^2-16}{x-4}=$

(a) 8	(b) -2	(c) 4	(d) 1

(3) $\lim_{x\to 0}\frac{\sqrt{x+1}-1}{x}=$

(a) 10	(b) 2	(c) $\frac{1}{2}$	(d) $\frac{1}{10}$

(4) If $\lim_{x\to 1}f(x)=5$, $\lim_{x\to 1}g(x)=-1$, $\lim_{x\to 1}h(x)=2$, then $\lim_{x\to 1}[2f(x)g(x)h(x)]=$

(a) -20	(b) 48	(c) 12	(d) 1

(5) If $f(x)=\begin{cases}2x+3 & ; x\ge 0\\ 2x+5 & ; x<0\end{cases}$, then $\lim_{x\to 0}f(x)=$

(a) 3	(b) 5	(c) 1	(d) Does not exist

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

(a) True	(b) False

(7) $\lim_{x\to\infty}\frac{\sqrt{9x^2+1}}{3x}=$

(a) -4	(b) 4	(c) 3	(d) 1

(8)	$\lim_{x\to\infty}\frac{1-x-2x^2}{x^2-7}=$

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

(9)	The vertical asymptotes of the graph of the function $y=\frac{2x^2+x-1}{x^2+x-2}$ are

(a) $x=2$	(b) $x=1, x=-2$	(c) $y=2$	(d) $y=1, y=-2$

(10)	The horizontal asymptote of the graph of the function $y=\frac{2x^2+x-1}{x^2+x-2}$ is

(a) $x=2$	(b) $x=1, x=-2$	(c) $y=2$	(d) $y=1, y=-2$

(11)	Any rational function is continuous on $\mathbb{R}=(-\infty,\infty)$.

(a) True	(b) False

(12)	If f and g are continuous at a, then $\frac{f}{g}$ is also continuous at a.

(a) True	(b) False

(13)	$f(x)=\begin{cases} x & \text{if } x\neq 1 \\ -3 & \text{if } x=1 \end{cases}$, then $\lim_{x\to 1^-} f(x)=$

(a) 0	(b) 1	(c) -1	(d) Does not exist

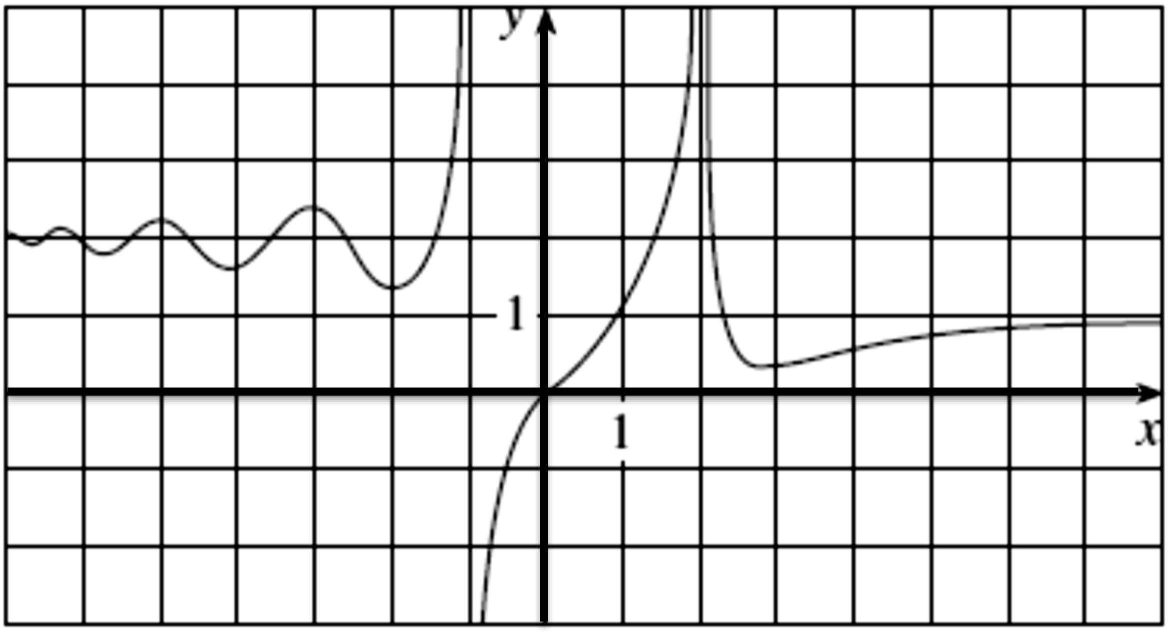
(14)	If $\lim_{x\to 2}\frac{g(x)+3}{x}=-3$, then $\lim_{x\to 2} g(x)=$

(a) 0	(b) 3	(c) -3	(d) -9

(15)	The function $f(x)=x^2+\sqrt{2x-6}$ is continuous on

(a) $(0,3)\cup(3,\infty)$	(b) $(3,\infty)$	(c) $[3,\infty)$	(d) $(-\infty,\infty)$

In [16-20] consider the following graph of the function $f(x)$ then



(16)	$\lim_{x \to -1^+} f(x) =$			
	(a) $-\infty$	(b) 0	(c) 4	(d) ∞

(17)	$\lim_{x \to -1^-} f(x) =$			
	(a) $-\infty$	(b) 0	(c) 4	(d) ∞

(18)	The function f is continuous at $x = 2$.	
	(a) True	(b) False

(19)	The vertical asymptotes of the function f are:			
	(a) $y = -2,\ y = -1$	(b) $x = -1,\ x = 2$	(c) $y = 1,\ y = 2$	(d) $x = 1,\ x = -2$

(20)	The horizontal asymptotes of the function f are:			
	(a) $y = -2,\ y = -1$	(b) $x = -1,\ x = 2$	(c) $y = 1,\ y = 2$	(d) $x = 1,\ x = -2$

(21)	$\lim_{x \to \infty} \left(\sqrt{x^2 + 1} - x \right) =$			
	(a) 4	(b) 0	(c) 2	(d) Does not exist

(22)	If $y=(2x^3+2)(5x^2-3)$, then $y'=$			
	(a) $60x^3$	(b) $50x^4-18x^2+20x$	(c) $50x^4-18x^2$	(d) $4x^3-3x^2+6x$

(23)	If $f(x)=(x-1)e^x$, then $f''(x)=$			
	(a) xe^x	(b) $e^x(x-1)$	(c) $e^x(x+1)$	(d) e^x

(24)	If $y=e^2$ the $y'=$			
	(a) e	(b) $2e$	(c) 0	(d) e^2

(25)	An equation of the tangent line to the curve $y=\sqrt[4]{x}$ at the point $(1,1)$ is			
	(a) $4y-x=3$	(b) $4y+x=3$	(c) $y-4x=5$	(d) $y+4x=5$

(26)	If f is a differentiable function at a, then f is a continuous function at a.	
	(a) True	(b) False

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

(28)	$\lim_{x\to\infty}e^x=$			
	(a) 1	(b) 0	(c) $-\infty$	(d) ∞

(29)	If $f(x)$ is a differentiable function, then $f'(x)=$	
	(a) $\lim_{h\to 0}\frac{f(x+h)+f(x)}{h}$	(b) $\lim_{h\to 0}\frac{f(x)-f(x+h)}{h}$
	(c) $\lim_{h\to\infty}\frac{f(x+h)-f(x)}{h}$	(d) $\lim_{h\to 0}\frac{f(x+h)-f(x)}{h}$

(30)	If $y=\frac{x}{e^x}$, the $y'=$			
	(a) $\frac{1+x}{e^x}$	(b) $\frac{1+x}{e^{2x}}$	(c) $\frac{1-x}{e^x}$	(d) $\frac{1-x}{e^{2x}}$