King Abdulaziz University | Final Exam – Math110

Rabigh College of Science and Arts | Date: 17/4/1438

Department of Mathematics | Time: 120 minutes

Name…… ID:……..... **A**

Choose the correct answer of the following questions:

(1)	The critical numbers of the function $f(x)=2x^3+3x^2-36x$ are:			
	(A) 0, 1,3	(B) -3 ,2	(C) 0,1	(D) 0, 1,-2
(2)	The function $f(x)=2x^3+3x^2-36x$ has a local maximum value at			
	(A) $x=3$	(B) $x=-1$	(C) $x=-3$	(D) $x=-2$
(3)	The function $f(x)=2x^3+3x^2-36x$ has a local minimum value at			
	(A) $x=-1$	(B) $x=2$	(C) $x=3$	(D) $x=-2$
(4)	The function $f(x)=2x^3+3x^2-36x$ is increasing on:			
	(A) $(-\infty,-3)\cup(2,\infty)$	(B) $(-\infty,-3)$	(C) $(2,\infty)$	(D) $(-3,2)$
(5)	The function $f(x)=2x^3+3x^2-36x$ is decreasing on:			
	(A) $(-\infty,-3)\cup(2,\infty)$	(B) $(-\infty,-3)$	(C) $(2,\infty)$	(D) $(-3,2)$
(6)	The graph of the function $f(x)=2x^3+3x^2-36x$ is concave upward on:			
	(A) $(-\infty,-\frac{1}{2})$	(B) $(-\frac{1}{2},\infty)$	(C) $(1,\infty)$	(D) $(0,\infty)$
(7)	The graph of the function $f(x)=2x^3+3x^2-36x$ is concave downward on:			
	(A) $(-\infty,-\frac{1}{2})$	(B) $(-\frac{1}{2},\infty)$	(C) $(1,\infty)$	(D) $(0,\infty)$
(8)	The graph of the function $f(x)=2x^3+3x^2-36x$ has an inflection point on:			
	(A) $(-1,37)$	(B) $(\frac{1}{2},-17)$	(C) $(0,0)$	(D) $(-\frac{1}{2},\frac{37}{2})$
(9)	The vertical asymptotes of the graph of the function $y=\dfrac{1-x}{3x+3}$ is			
	(A) x= -1	(B) x=1	(C) y=1	(D) y= -1
(10)	The horizontal asymptotes of the graph of the function $y=\dfrac{1-x^3}{x^2+x^3}$ is			
	(A) x= -1	(B) x=1	(C) y=1	(D) y= -1
(11)	$\lim\limits_{x\to-3}\dfrac{x^2+x-6}{x+3}=$			
	(A) 0	(B) -5	(C) -1	(D) ∞

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

(A) 0	(B) 1	(C) -1	(D) ∞

(13) $\lim_{x\to\infty} e^x =$

(A) 1	(B) 0	(C) $-\infty$	(D) ∞

(14) The function $f(x)=\frac{x-5}{x^2-3x+2}$ is discontinuous at

(A) 0,-2	(B) -1,2	(C) 1,2	(D) -1,-2

(15) $\lim_{x\to1}\sin^{-1}\left(\frac{x-1}{x^2-1}\right)$

(A) $\frac{\pi}{2}$	(B) $\frac{\pi}{6}$	(C) $\frac{\pi}{3}$	(D) Does not exist

(16) If $y=e^x\sec x$ then $y'=$

(A) $e^x\sec x(\tan x+1)$	(B) $e^x(\tan x+1)$	(C) $e^x(\sec x+\tan x)$	(D) $e^x\sec^2 x+\tan x$

(17) The function $f(x)=\begin{cases} e^x & x<0 \\ x^2 & x\geq 0 \end{cases}$ is continuous at $x=0$

(A)True	(B) False

(18) If $f(x)=\sin(\cos x)$, then $f'(x)=$

(A)$\cos x\cos(\cos x)$	(B) $-\sin x\cos(\cos x)$	(C) $\sin x\cos(\cos x)$	(D) $\cos x\sin(\cos x)$

(19) The inverse function of $f(x)=\sqrt{10-3x}$

(A) $f^{-1}(x)=\frac{10}{3}-x^2$	(B) $f^{-1}(x)=\frac{3}{10}-x^2$	(C) $f^{-1}(x)=\frac{3}{10-x^2}$	(D) $f^{-1}(x)=\frac{10-x^2}{3}$

(20) $\lim_{x\to0}\frac{1-\cos x}{x^2}=$

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

(21) If $y=x^x$ then $y'=$

(A) $x^x\ln x$	(B) x^x	(C) $x^x(1-\ln x)$	(D) $x^x(1+\ln x)$

(22) If $x^2+2y^2=5$ then $y'=$

(A) $-\frac{x}{y}$	(B) $\frac{2y}{x}$	(C) $\frac{x}{y}$	(D) $-\frac{x}{2y}$

(23) If $y=\ln(\sin x^3)$ then $y'=$

(A) $-3x^2\cos^3 x$	(B) $3x^2\sin x^3$	(C) $3x^2\cot x^3$	(D) $3x^2\cot^3 x$

(24) The domain of $f(x)=\frac{1}{\sqrt{x-5}}$ is:

(A) $(5,\infty)$	(B) $[5,\infty)$	(C) $(-\infty,5)$	(D) $(-\infty,5]$

(25) If $f(x)=(7)^{\sin 3x}$; then $f'(x)=$

(A) $(7)^{\sin 3x}\ln 7$	(B) $-3(7)^{\sin 3x}\cos 3x\ln 7$	(C) $(7)^{\sin 3x}\cos 3x\ln 7$	(D) $3(7)^{\sin 3x}\cos 3x\ln 7$

(26) An equation for tangent line to $f(x)=\frac{2}{x^2+1}$ at the point $(1,1)$ is:

(A) $y=2x-1$	(B) $y=x$	(C) $y=-x+2$	(D) $y=-2x+3$

(27) $\lim_{x\to\infty}\frac{1-e^x}{1+2e^x}=$

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

(28) If $\sin\theta=\frac{2}{5}$, $0\le\theta\le\frac{\pi}{2}$ then $\sec\theta=$

(A) $\frac{\sqrt{21}}{5}$	(B) $\frac{5}{\sqrt{21}}$	(C) $\frac{\sqrt{21}}{2}$	(D) $\frac{5}{2}$

(29) The function $y=\frac{x^3}{1-x^2}$ is classified as

(A) Polynomial	(B) Exponential	(C) Rational	(D) Power

(30) If the graph of $y=8x^2-1$ is compressed vertically by a factor of 4, the equation for the new graph is

(A) $2x^2-\frac{1}{4}$	(B) $4x^2-\frac{1}{4}$	(C) $32x^2-4$	(D) $32x^2+4$

(31) If the graph of $y=x^2$ is shifted up 2 units and left 3 units , the equation for the new graph is

(A) $y=(x-3)^2-2$	(B) $y=(x+3)^2-2$	(C) $y=(x+3)^2+2$	(D) $y=(x-3)^2+2$

(32) Let $f(x)=x^{10}$ and $g(x)=x^2+1$, then $(f\circ g)(x)=$

(A) x^2+1	(B) $(x^2+1)^{10}$	(C) x^2+10	(D) $x^{20}+1$

(33) If $3=e^{4x-5}$; then $x=$

(A) $x=4(\ln 3-5)$	(B) $x=\frac{5}{3}$	(C) $x=\frac{1}{4}(\ln 3+5)$	(D) $x=\frac{1}{4}(\ln 3-5)$

(34) If f has a local maximum or minimum at c, then c is a critical number of f.

(A)True	(B) False

(35)	The function $f(x) = x^3 + 1$ is one -to –one	
	(A)True	(B) False

(36)	The function $f(x) = \|12x\|$ is			
	(A) Even	(B) Odd	(C) Neither even nor odd	(D) Even and odd

(37)	The solution set of the inequality $-11 < 1 + 3x \le 16$ is			
	(A) $(-4,5)$	(B) $[-5,4)$	(C) $[-4,5]$	(D) $[-4,5)$

(38)	$\lim_{\theta \to 0} \frac{\sin(9\theta)}{7\theta} =$			
	(A) 9	(B) 7	(C) $\frac{9}{7}$	(D) $\frac{7}{9}$

(39)	If $f(x) = \tan^{-1} 2x$ then $f''(x) =$			
	(A) $\frac{2}{1+4x^2}$	(B) $-\frac{16}{(1+4x^2)^2}$	(C) $-\frac{16x}{(1+4x^2)^2}$	(D) $-\frac{2}{1+4x^2}$

(40)	The range of the function $y = \cos x$ is			
	(A) $(-1,1)$	(B) $(-\infty,\infty)$	(C) $(1,\infty)$	(D) $[-1,1]$