King Abdul Aziz University	Faculty of Sciences	Mathematics Department
Math 110	Final Test Spring 2011 (40 Marks)	Time 120 m
Student Name:	Student Number:	B

1) The domain of $\log_3(x+3)$ is

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

2) $\lim_{x\to 1}\frac{x-1}{\ln x}=$

a ∞ b 2 c 1 d 0

3) If $f(x)=\cot^{-1}(x)$ and $g(x)=\cot(x)$ then $(f\circ g)(x)=$

a 1 b $\cot x \cot^{-1} x$ c x d $\cot x$

4) The function $f(x)=\frac{x+1}{x^2-49}$ is continuous on

a $\{x\in\mathbb{R}: x\neq\pm 7\}$ b $[-7,7]$

c $(-\infty,-7)\cup(7,\infty)$ d $\{\pm 7\}$

5) If $x^2-4=3xy-y^2$, then $y'=$

a $\frac{3y-2x}{2y-3x}$ b $\frac{2x}{y}$

c $\frac{2x}{3-2y}$ d $\frac{2x+y}{3x-2y}$

6) If $y=3^x\tan x$, then $y'=$

a $3^x\ln 3\tan x-3^x\sec^2 x$ b $3^x\ln 3\tan x+3^x\sec^2 x$

c $3^x\tan x-3^x\sec^2 x$ d $3^x\tan x+3^x\sec^2 x$

7) If $f(x)=\frac{\ln x}{x^2}$, then $f'(1)=$

a 0 b 4 c 2 d 1

8) If $y=(2x^2+\csc x)^7$, then $y'=$

a $7(2x^2+\csc x)^6(4x-\csc x\cot x)$ b $7(2x^2+\csc x)^6$

c $7(2x^2+\csc x)^6(4x+\csc x\cot x)$ d $28x(2x^2+\csc x)^6$

9) The absolute minimum point of $f(x)=3x^2-12x+2$ in $[0,3]$ is

a $(3,-7)$ b $(0,2)$ c $(2,-10)$ d $(2,-12)$

10) If $\ln(3-x)=5$, then $x=$

a) $3e^{-5}$ b) -2 c) $3-e$ d) $3-e^5$

11) The slope of the perpendicular line to the line $2y+3x-6=0$ is

a) $\frac{2}{3}$ b) $-\frac{2}{3}$ c) $-\frac{3}{2}$ d) $\frac{3}{2}$

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

a) does not exist   b) $\frac{1}{4}$ c) $\frac{1}{8}$ d) $\frac{1}{16}$

13) $\csc^{-1}(2)=$

a) $\frac{\pi}{2}$ b) $\frac{\pi}{6}$ c) $\frac{\pi}{4}$ d) $\frac{\pi}{3}$

14) $\lim_{x\to 0}\frac{\tan 5x}{3x}=$

a) $\frac{1}{3}$ b) 5 c) $\frac{3}{5}$ d) $\frac{5}{3}$

15) If $f(x)=2x+3$, then $f^{-1}(x)=$

a) $\frac{x+3}{2}$ b) $\frac{x}{2}-3$

c) $\frac{x}{2}+3$ d) $\frac{x-3}{2}$

16) If $f(x)=\cos x$, then $f^{(47)}(x)=$

a) $\sin x$ b) $-\sin x$ c) $\cos x$ d) $-\cos x$

17) $\lim_{x\to\infty}\left(\sqrt{x^2+x}-x\right)=$

a) $\frac{1}{2}$ b) 1 c) 0 d) $-\frac{1}{2}$

18) If $y=\sin^4(3x)$, then $y'=$

a) $12\sin^3(3x)\cos(3x)$ b) $4\sin^3(3x)\cos(3x)$

c) $3\cos^2(3x)$ d) $3\sin^4(3x)+12\sin^3 x\cos x$

19) $\frac{2\pi}{3}$ rad $=$

a) 120^0 b) 150^0 c) 270^0 d) 210^0

20) If $e^{-x} = 5$, then $x =$

[a] $\ln 5$ [b] $-\ln 5$ [c] 5^{-1} [d] -5

21) The tangent line equation to the curve $y = \dfrac{2x}{x-1}$ at the point $(0,0)$ is

[a] $y = -2x - 1$ [b] $y = 2x + 1$ [c] $y = 2x$ [d] $y = -2x$

22) If the graph of the function $f(x) = e^x$ is shifted a distance 2 units to the right, then the new graph represented the graph of the function

[a] e^{x+2} [b] $e^x + 2$ [c] e^{x-2} [d] $e^x - 2$

23) The distance between the points $(-1,2)$ and $(2,-1)$ is

[a] 3 [b] $2\sqrt{3}$ [c] 9 [d] $3\sqrt{2}$

24) The horizontal asymptote of $f(x) = \dfrac{1-x}{3x+1}$ is

[a] $x = \dfrac{1}{3}$ [b] $y = \dfrac{1}{3}$ [c] $y = -\dfrac{1}{3}$ [d] $x = -\dfrac{1}{3}$

25)If $|x+4| = 3$, then $x =$

[a] 7 [b] 1 or 7 [c] -1 or -7 [d] 1

26) If $y = \sin^{-1}(e^x)$, then $y' =$

[a] $-\dfrac{1}{\sqrt{1-e^{2x}}}$ [b] $\dfrac{e^x}{\sqrt{1-e^{2x}}}$

[c] $-\dfrac{e^x}{\sqrt{1-e^{2x}}}$ [d] $\dfrac{1}{\sqrt{1-e^{2x}}}$

27) The range of e^x is

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

28) $\lim\limits_{x\to 3^-} \dfrac{x+1}{x-3} =$

[a] 3 [b] ∞ [c] -3 [d] $-\infty$

29) $\lim\limits_{x\to 1} \dfrac{x-1}{\ln x} =$

[a] ∞ [b] 2 [c] 0 [d] 1

30) If $y = x^x$, then $y' =$

[a] $1+\ln x$ [b] x^x [c] $x^x(1+\ln x)$ [d] $x^x \ln x$

31) The values in $(0,2)$ which makes $f(x)=x^3-3x^2+2x+5$ satisfied Rolle's Theorem on $[0,2]$ are

a) $1\pm\frac{4\sqrt{3}}{6}\in[0,2]$ b) $1\pm\frac{\sqrt{3}}{3}\in(0,2)$ c) $-1\pm\frac{\sqrt{3}}{3}\in(0,2)$ d) $1\pm\frac{\sqrt{3}}{6}\in(0,2)$

32) The domain of $\frac{x+3}{\sqrt{4-x^2}}$ is

a) $[-2,2]$ b) $(-\infty,-2)\cup(2,\infty)$ c) $(-2,2)$ d) $(-\infty,-2]\cup[2,\infty)$

33) The critical numbers of the function $f(x)=\frac{1}{3}x^3+\frac{1}{2}x^2-2x+1$ are

a) $1,2$ b) $-2,1$ c) $-1,2$ d) $-1,-2$

34) The function $f(x)=\frac{1}{3}x^3+\frac{1}{2}x^2-2x+1$ is increasing on

a) $(-1,2)$ b) $(-\infty,-2)\cup(1,\infty)$ c) $(-2,1)$ d) $(-\infty,-1)\cup(2,\infty)$

35) The function $f(x)=\frac{1}{3}x^3+\frac{1}{2}x^2-2x+1$ is decreasing on

a) $(-1,2)$ b) $(-\infty,-2)\cup(1,\infty)$ c) $(-2,1)$ d) $(-\infty,-1)\cup(2,\infty)$

36) The function $f(x)=\frac{1}{3}x^3+\frac{1}{2}x^2-2x+1$ has a relative maximum point at

a) $(1,-\frac{1}{6})$ b) $(-1,\frac{19}{6})$ c) $(-2,\frac{13}{3})$ d) $(2,\frac{5}{3})$

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38) The graph of $f(x)=\frac{1}{3}x^3+\frac{1}{2}x^2-2x+1$ concave upward on

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40) The function $f(x)=\frac{1}{3}x^3+\frac{1}{2}x^2-2x+1$ has an inflection point at

a) $(\frac{1}{2},\frac{-1}{12})$ b) $(\frac{1}{2},\frac{1}{6})$ c) $(-\frac{1}{2},\frac{25}{12})$ d) $(-\frac{1}{2},\frac{49}{24})$