King Abdul Aziz University	Faculty of Sciences	Mathematics Department
Math 110	Final Test Fall 2013 (40 Marks)	Time 120 m
Student Name:	Student Number:	$\boxed{A}$

1) If $f(x)=2x-9$, then $f^{-1}(x)=$

$\boxed{a}$ $\dfrac{x-9}{2}$ $\boxed{b}$ $\dfrac{x}{2}-9$ $\boxed{c}$ $\dfrac{x+9}{2}$ $\boxed{d}$ $\dfrac{x}{2}+9$

2) If $y=\sqrt{3x^2+6x}$, then $y'=$

$\boxed{a}$ $\dfrac{6(x+1)}{\sqrt{3x^2+6x}}$ $\boxed{b}$ $\dfrac{x+6}{\sqrt{3x^2+6x}}$ $\boxed{c}$ $\dfrac{3(x+1)}{\sqrt{3x^2+6x}}$ $\boxed{d}$ $\dfrac{x+1}{2\sqrt{3x^2+6x}}$

3) If $y=\log_5(x^3-2\csc x)$, then $y'=$

$\boxed{a}$ $\dfrac{3x^2+2\csc x\cot x}{x^3-2\csc x}$ $\boxed{b}$ $\dfrac{3x^2+2\csc x\cot x}{x^3-2\csc x\ln 5}$

$\boxed{c}$ $\dfrac{3x^2+2\csc x\cot x}{\left(x^3-2\csc x\right)\ln 5}$ $\boxed{d}$ $\dfrac{3x^2-2\csc x\cot x}{\left(x^3-2\csc x\right)\ln 5}$

4) If $-7\le 2x+3<5$, then $x=$

$\boxed{a}$ $(-5,1)$ $\boxed{b}$ $(-5,1]$ $\boxed{c}$ $[-5,1)$ $\boxed{d}$ $[-5,1]$

5) If $f(x)=x^2$, then $f'(x)=$

$\boxed{a}$ $\lim\limits_{x\to 0}\dfrac{(x+h)^2-x^2}{h}$ $\boxed{b}$ $\lim\limits_{x\to 0}\dfrac{(x+h)^2+x^2}{h}$

$\boxed{c}$ $\lim\limits_{h\to 0}\dfrac{(x+h)^2+x^2}{h}$ $\boxed{d}$ $\lim\limits_{h\to 0}\dfrac{(x+h)^2-x^2}{h}$

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

$\boxed{a}$ $\{\pm 2\}$ $\boxed{b}$ $[-2,2]$ $\boxed{c}$ $\{x\in\mathbb{R}: x\ne\pm 2\}$ $\boxed{d}$ $(-\infty,-2)\cup(2,\infty)$

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

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

8) $\csc\left(\tan^{-1}x\right)=$

$\boxed{A}$ $\dfrac{1}{\sqrt{x^2+1}}$ $\boxed{B}$ $\dfrac{x}{\sqrt{x^2+1}}$ $\boxed{C}$ $\sqrt{x^2+1}$ $\boxed{D}$ $\dfrac{\sqrt{x^2+1}}{x}$

9) $\lim_{x\to 5^+} \frac{x+1}{x-5} =$

$\boxed{a}$ -5 $\boxed{b}$ 5 $\boxed{c}$ $-\infty$ $\boxed{d}$ ∞

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

$\boxed{a}$ 0 $\boxed{b}$ does not exist $\boxed{c}$ 2 $\boxed{d}$ $\frac{1}{2}$

11) The values in $(-1,3)$ which makes $f(x) = x^2 - 5x + 7$ satisfied Mean Value Theorem on $[-1,3]$ is

$\boxed{a}$ 1 $\boxed{b}$ -4 $\boxed{c}$ 0 $\boxed{d}$ 2

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

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

13) If $y = \ln(\cos x)$, then $y' =$

$\boxed{a}$ $\tan x$ $\boxed{b}$ $-\tan x$ $\boxed{c}$ $\cot x$ $\boxed{d}$ $-\cot x$

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

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

15) The absolute maximum value of $f(x) = x^3 - 6x^2 + 9x + 2$ on $[0,4]$ is

$\boxed{a}$ 2 $\boxed{b}$ 6 $\boxed{c}$ 7 $\boxed{d}$ 12

16) The absolute minimum value of $f(x) = x^3 - 6x^2 + 9x + 2$ on $[0,4]$ is

$\boxed{a}$ 2 $\boxed{b}$ 6 $\boxed{c}$ 0 $\boxed{d}$ -3

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

$\boxed{a}$ $x^x(1+\ln x)$ $\boxed{b}$ $1+\ln x$ $\boxed{c}$ x^x $\boxed{d}$ $x^x \ln x$

18) If $y = \tan^{-1}\left(\frac{2x}{3}\right)$, then $y' =$

$\boxed{a}$ $-\frac{6}{9+4x^2}$ $\boxed{b}$ $\frac{9}{9+4x^2}$ $\boxed{c}$ $-\frac{9}{9+4x^2}$ $\boxed{d}$ $\frac{6}{9+4x^2}$

19) If $x^2 + y^2 = 3xy + 7$, then $y' =$

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

20) If $y = \sin x \sec x$, then $y' =$

$\boxed{a}$ $\sin x \tan x + 1$ $\boxed{b}$ $\sec^2 x$ $\boxed{c}$ $\sin x \tan x - 1$ $\boxed{d}$ $\sin x \sec x \tan x - 1$

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

$\boxed{a}$ $4\cos^3(4x)$ $\boxed{b}$ $3\sin^2(4x)\cos(4x)$

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

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

$\boxed{a}$ $y = -2x$ $\boxed{b}$ $y = -2x + 1$ $\boxed{c}$ $y = 2x$ $\boxed{d}$ $y = 2x - 1$

23) If $y = 3^x \cot x$, then $y' =$

$\boxed{a}$ $3^x \ln 3 \cot x + 3^x \sec^2 x$ $\boxed{b}$ $3^x \cot x + 3^x \sec^2 x$

$\boxed{c}$ $3^x \cot x - 3^x \csc^2 x$ $\boxed{d}$ $3^x \ln 3 \cot x - 3^x \csc^2 x$

24) If $y = \left(2x^2 + \sec x\right)^7$, then $y' =$

$\boxed{a}$ $7\left(2x^2 + \sec x\right)^6$ $\boxed{b}$ $7\left(2x^2 + \sec x\right)^6 (4x - \sec x \tan x)$

$\boxed{c}$ $7\left(2x^2 + \sec x\right)^6 (4x + \sec x \tan x)$ $\boxed{d}$ $28x\left(2x^2 + \sec x\right)^6$

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

$\boxed{a}$ $\dfrac{2}{3}$ $\boxed{b}$ $-\dfrac{2}{3}$ $\boxed{c}$ $-\dfrac{3}{2}$ $\boxed{d}$ $\dfrac{3}{2}$

26) If the graph of the function $f(x) = 3^x$ is shifted a distance 2 units upward, then the new graph represented the graph of the function

$\boxed{a}$ 3^{x+2} $\boxed{b}$ $3^x + 2$ $\boxed{c}$ 3^{x-2} $\boxed{d}$ $3^x - 2$

27) If $y = \ln\dfrac{x+1}{x-2}$, then $y' =$

$\boxed{a}$ $-\dfrac{3}{(x+1)(x-2)}$ $\boxed{b}$ $\dfrac{3}{(x+1)(x-2)}$

$\boxed{c}$ $\dfrac{1}{(x+1)(x-2)}$ $\boxed{d}$ $-\dfrac{1}{(x+1)(x-2)}$

28) $\lim\limits_{x \to 0} \dfrac{\sin 3x}{5x} =$

$\boxed{a}$ $\dfrac{3}{5}$ $\boxed{b}$ $\dfrac{5}{3}$ $\boxed{c}$ $\dfrac{1}{5}$ $\boxed{d}$ 3

29) $D^{(125)}(\cos x) =$			
$\boxed{a}$ $\sin x$	$\boxed{b}$ $-\sin x$	$\boxed{c}$ $\cos x$	$\boxed{d}$ $-\cos x$
30) $\dfrac{5\pi}{6}$ rad $=$			
$\boxed{a}$ 120^0	$\boxed{b}$ 150^0	$\boxed{c}$ 270^0	$\boxed{d}$ 210^0
31) The distance between the points $(-1,2)$ and $(2,-1)$ is			
$\boxed{a}$ $2\sqrt{3}$	$\boxed{b}$ $3\sqrt{2}$	$\boxed{c}$ 9	$\boxed{d}$ 3
32) If $y = e^{2x}$, then $y^{(5)} =$			
$\boxed{a}$ $128e^{2x}$	$\boxed{b}$ $16e^{2x}$	$\boxed{c}$ $64e^{2x}$	$\boxed{d}$ $32e^{2x}$
33) The critical numbers of the function $f(x) = 2x^3 + 3x^2 - 12x + 15$ are			
$\boxed{a}$ $1,-2$	$\boxed{b}$ $-1,2$	$\boxed{c}$ $1,2$	$\boxed{d}$ $-1,-2$
34) The function $f(x) = 2x^3 + 3x^2 - 12x + 15$ is increasing on			
$\boxed{a}$ $(-\infty,-2)\cup(-1,\infty)$	$\boxed{b}$ $(-\infty,-2)\cup(1,\infty)$	$\boxed{c}$ $(-\infty,-1)\cup(2,\infty)$	$\boxed{d}$ $(-\infty,1)\cup(2,\infty)$
35) The function $f(x) = 2x^3 + 3x^2 - 12x + 15$ is decreasing on			
$\boxed{a}$ $(-2,-1)$	$\boxed{b}$ $(-2,1)$	$\boxed{c}$ $(1,2)$	$\boxed{d}$ $(-1,2)$
36) The function $f(x) = 2x^3 + 3x^2 - 12x + 15$ has a relative maximum at			
$\boxed{a}$ $(1,8)$	$\boxed{b}$ $(-1,28)$	$\boxed{c}$ $(2,19)$	$\boxed{d}$ $(-2,35)$
37) The function $f(x) = 2x^3 + 3x^2 - 12x + 15$ has a relative minimum at			
$\boxed{a}$ $(1,8)$	$\boxed{b}$ $(-1,28)$	$\boxed{c}$ $(2,19)$	$\boxed{d}$ $(-2,35)$
38) The graph of $f(x) = 2x^3 + 3x^2 - 12x + 15$ concave upward on			
$\boxed{a}$ $(-\infty,\frac{1}{2})$	$\boxed{b}$ $(-\infty,-\frac{1}{2})$	$\boxed{c}$ $(-\frac{1}{2},\infty)$	$\boxed{d}$ $(\frac{1}{2},\infty)$
39) The graph of $f(x) = 2x^3 + 3x^2 - 12x + 15$ concave downward on			
$\boxed{a}$ $(-\infty,\frac{1}{2})$	$\boxed{b}$ $(-\infty,-\frac{1}{2})$	$\boxed{c}$ $(-\frac{1}{2},\infty)$	$\boxed{d}$ $(\frac{1}{2},\infty)$
40) The function $f(x) = 2x^3 + 3x^2 - 12x + 15$ has an inflection at			
$\boxed{a}$ $(\frac{1}{2},10)$	$\boxed{b}$ $(-\frac{1}{2},10)$	$\boxed{c}$ $(\frac{1}{2},\frac{43}{2})$	$\boxed{d}$ $(-\frac{1}{2},\frac{43}{2})$

King Abdul Aziz University Faculty of Sciences Mathematics Department
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Student Name: Student Number: $\boxed{B}$

1) If $y = \cos x \csc x$, then $y' =$

$\boxed{a}$ $-\csc^2 x$ $\boxed{b}$ $1-\cos x \cot x$ $\boxed{c}$ $-1+\cos x \cot x$ $\boxed{d}$ $1-\cos x \csc x \cot x$

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

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

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

$\boxed{a}$ $\{x \in \mathbb{R} : x \neq \pm 7\}$ $\boxed{b}$ $[-7,7]$ $\boxed{c}$ $(-\infty,-7)\cup(7,\infty)$ $\boxed{d}$ $\{\pm 7\}$

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

$\boxed{a}$ $\dfrac{3y-2x}{2y-3x}$ $\boxed{b}$ $\dfrac{2x}{y}$ $\boxed{c}$ $\dfrac{2x}{3-2y}$ $\boxed{d}$ $\dfrac{2x+y}{3x-2y}$

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

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

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

6) If $y = \log_5(x^3 - 2\csc x)$, then $y' =$

$\boxed{a}$ $\dfrac{3x^2+2\csc x \cot x}{(x^3-2\csc x)\ln 5}$ $\boxed{b}$ $\dfrac{3x^2+2\csc x \cot x}{x^3-2\csc x \ln 5}$

$\boxed{c}$ $\dfrac{3x^2+2\csc x \cot x}{x^3-2\csc x}$ $\boxed{d}$ $\dfrac{3x^2-2\csc x \cot x}{(x^3-2\csc x)\ln 5}$

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

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

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

8) The absolute minimum value of $f(x) = x^3 - 6x^2 + 9x + 2$ on $[0,4]$ is

$\boxed{a}$ 6 $\boxed{b}$ 0 $\boxed{c}$ 2 $\boxed{d}$ -3

9) The absolute maximum value of $f(x) = x^3 - 6x^2 + 9x + 2$ on $[0,4]$ is

$\boxed{a}$ 6 $\boxed{b}$ 2 $\boxed{c}$ 7 $\boxed{d}$ 12

10) If $y=\sqrt{3x^2-6x}$, then $y'=$			
$\boxed{a}$ $\dfrac{x-6}{\sqrt{3x^2-6x}}$	$\boxed{b}$ $\dfrac{6(x-1)}{\sqrt{3x^2-6x}}$	$\boxed{c}$ $\dfrac{x-1}{2\sqrt{3x^2-6x}}$	$\boxed{d}$ $\dfrac{3(x-1)}{\sqrt{3x^2-6x}}$
11) The slope of the perpendicular line to the line $2y+3x-6=0$ is			
$\boxed{a}$ $\dfrac{2}{3}$	$\boxed{b}$ $-\dfrac{2}{3}$	$\boxed{c}$ $-\dfrac{3}{2}$	$\boxed{d}$ $\dfrac{3}{2}$
12) If $y=\ln\dfrac{x+1}{x-2}$, then $y'=$			
$\boxed{a}$ $\dfrac{3}{(x+1)(x-2)}$	$\boxed{b}$ $-\dfrac{3}{(x+1)(x-2)}$		
$\boxed{c}$ $\dfrac{1}{(x+1)(x-2)}$	$\boxed{d}$ $-\dfrac{1}{(x+1)(x-2)}$		
13) $\sec\left(\tan^{-1}x\right)=$			
$\boxed{A}$ $\dfrac{1}{\sqrt{x^2+1}}$	$\boxed{B}$ $\dfrac{x}{\sqrt{x^2+1}}$	$\boxed{C}$ $\sqrt{x^2+1}$	$\boxed{D}$ $\dfrac{\sqrt{x^2+1}}{x}$
14) $\lim\limits_{x\to 0}\dfrac{\tan 5x}{3x}=$			
$\boxed{a}$ $\dfrac{1}{3}$	$\boxed{b}$ 5	$\boxed{c}$ $\dfrac{3}{5}$	$\boxed{d}$ $\dfrac{5}{3}$
15) If $f(x)=2x+7$, then $f^{-1}(x)=$			
$\boxed{a}$ $\dfrac{x+7}{2}$	$\boxed{b}$ $\dfrac{x}{2}-7$	$\boxed{c}$ $\dfrac{x}{2}+7$	$\boxed{d}$ $\dfrac{x-7}{2}$
16) $D^{(127)}(\cos x)=$			
$\boxed{a}$ $\sin x$	$\boxed{b}$ $-\sin x$	$\boxed{c}$ $\cos x$	$\boxed{d}$ $-\cos x$
17) $\lim\limits_{x\to\infty}\left(\sqrt{x^2+x}-x\right)=$			
$\boxed{a}$ $\dfrac{1}{2}$	$\boxed{b}$ 1	$\boxed{c}$ 0	$\boxed{d}$ $-\dfrac{1}{2}$
18) If $y=\sin^4(3x)$, then $y'=$			
$\boxed{a}$ $12\sin^3(3x)\cos(3x)$	$\boxed{b}$ $4\sin^3(3x)\cos(3x)$		
$\boxed{c}$ $3\cos^2(3x)$	$\boxed{d}$ $3\sin^4(3x)+12\sin^3 x\cos x$		

19) $\frac{2\pi}{3}$ rad $=$			
$\boxed{a}$ 120^0	$\boxed{b}$ 150^0	$\boxed{c}$ 270^0	$\boxed{d}$ 210^0
20) If $f(x) = x^2$, then $f'(x) =$			
$\boxed{a}$ $\lim\limits_{h \to 0} \frac{(x+h)^2 - x^2}{h}$	$\boxed{b}$ $\lim\limits_{x \to 0} \frac{(x+h)^2 + x^2}{h}$		
$\boxed{c}$ $\lim\limits_{h \to 0} \frac{(x+h)^2 + x^2}{h}$	$\boxed{d}$ $\lim\limits_{x \to 0} \frac{(x+h)^2 - x^2}{h}$		
21) The tangent line equation to the curve $y = \frac{2x}{x-1}$ at the point $(0,0)$ is			
$\boxed{a}$ $y = -2x - 1$	$\boxed{b}$ $y = 2x + 1$	$\boxed{c}$ $y = 2x$	$\boxed{d}$ $y = -2x$
22) If the graph of the function $f(x) = 3^x$ is shifted a distance 2 units to the right, then the new graph represented the graph of the function			
$\boxed{a}$ 3^{x+2}	$\boxed{b}$ $3^x + 2$	$\boxed{c}$ 3^{x-2}	$\boxed{d}$ $3^x - 2$
23) The distance between the points $(-1,2)$ and $(2,-1)$ is			
$\boxed{a}$ 3	$\boxed{b}$ $2\sqrt{3}$	$\boxed{c}$ 9	$\boxed{d}$ $3\sqrt{2}$
24) If $y = \ln(\sin x)$, then $y' =$			
$\boxed{a}$ $\tan x$	$\boxed{b}$ $-\tan x$	$\boxed{c}$ $\cot x$	$\boxed{d}$ $-\cot x$
25) If $-7 \le 2x + 3 \le 5$, then $x =$			
$\boxed{a}$ $(-5,1)$	$\boxed{b}$ $(-5,1]$	$\boxed{c}$ $[-5,1)$	$\boxed{d}$ $[-5,1]$
26) If $y = \cot^{-1}\left(\frac{2x}{3}\right)$, then $y' =$			
$\boxed{a}$ $-\frac{6}{9+4x^2}$	$\boxed{b}$ $\frac{9}{9+4x^2}$	$\boxed{c}$ $-\frac{9}{9+4x^2}$	$\boxed{d}$ $\frac{6}{9+4x^2}$
27) If $y = e^{2x}$, then $y^{(4)} =$			
$\boxed{a}$ $128e^{2x}$	$\boxed{b}$ $16e^{2x}$	$\boxed{c}$ $64e^{2x}$	$\boxed{d}$ $32e^{2x}$
28) $\lim\limits_{x \to 3^-} \frac{x+1}{x-3} =$			
$\boxed{a}$ 3	$\boxed{b}$ ∞	$\boxed{c}$ -3	$\boxed{d}$ $-\infty$
29) If $y = x^x$, then $y' =$			
$\boxed{a}$ $1 + \ln x$	$\boxed{b}$ x^x	$\boxed{c}$ $x^x(1 + \ln x)$	$\boxed{d}$ $x^x \ln x$

30) The critical numbers of the function $f(x) = 2x^3 - 3x^2 - 12x + 15$ are	
$\boxed{a}$ $1, -2$ $\boxed{b}$ $-1, 2$ $\boxed{c}$ $1, 2$ $\boxed{d}$ $-1, -2$	
31) The function $f(x) = 2x^3 - 3x^2 - 12x + 15$ is increasing on	
$\boxed{a}$ $(-\infty, -2) \cup (-1, \infty)$ $\boxed{b}$ $(-\infty, -2) \cup (1, \infty)$ $\boxed{c}$ $(-\infty, -1) \cup (2, \infty)$ $\boxed{d}$ $(-\infty, 1) \cup (2, \infty)$	
32) The function $f(x) = 2x^3 - 3x^2 - 12x + 15$ is decreasing on	
$\boxed{a}$ $(-2, -1)$ $\boxed{b}$ $(-2, 1)$ $\boxed{c}$ $(1, 2)$ $\boxed{d}$ $(-1, 2)$	
33) The function $f(x) = 2x^3 - 3x^2 - 12x + 15$ has a relative maximum at	
$\boxed{a}$ $(1, 2)$ $\boxed{b}$ $(-1, 22)$ $\boxed{c}$ $(2, -5)$ $\boxed{d}$ $(-2, 11)$	
34) The function $f(x) = 2x^3 - 3x^2 - 12x + 15$ has a relative minimum at	
$\boxed{a}$ $(1, 2)$ $\boxed{b}$ $(-1, 22)$ $\boxed{c}$ $(2, -5)$ $\boxed{d}$ $(-2, 11)$	
35) The graph of $f(x) = 2x^3 - 3x^2 - 12x + 15$ concave upward on	
$\boxed{a}$ $(-\infty, \frac{1}{2})$ $\boxed{b}$ $(-\infty, -\frac{1}{2})$ $\boxed{c}$ $(-\frac{1}{2}, \infty)$ $\boxed{d}$ $(\frac{1}{2}, \infty)$	
36) The graph of $f(x) = 2x^3 - 3x^2 - 12x + 15$ concave downward on	
$\boxed{a}$ $(-\infty, \frac{1}{2})$ $\boxed{b}$ $(-\infty, -\frac{1}{2})$ $\boxed{c}$ $(-\frac{1}{2}, \infty)$ $\boxed{d}$ $(\frac{1}{2}, \infty)$	
37) The function $f(x) = 2x^3 - 3x^2 - 12x + 15$ has an inflection at	
$\boxed{a}$ $(\frac{1}{2}, 20)$ $\boxed{b}$ $(-\frac{1}{2}, 20)$ $\boxed{c}$ $(\frac{1}{2}, \frac{17}{2})$ $\boxed{d}$ $(-\frac{1}{2}, \frac{17}{2})$	
38) $\lim\limits_{x \to 1} \dfrac{x^2 - 1}{x - 1} =$	
$\boxed{a}$ 0 $\boxed{b}$ does not exist $\boxed{c}$ 2 $\boxed{d}$ $\dfrac{1}{2}$	
39) The domain of $\dfrac{x + 3}{\sqrt{4 - x^2}}$ is	
$\boxed{a}$ $[-2, 2]$ $\boxed{b}$ $(-\infty, -2) \cup (2, \infty)$ $\boxed{c}$ $(-2, 2)$ $\boxed{d}$ $(-\infty, -2] \cup [2, \infty)$	
40) The values in $(-1, 3)$ which makes $f(x) = x^2 - 5x + 7$ satisfied Mean Value Theorem on $[-1, 3]$ is	
$\boxed{a}$ -4 $\boxed{b}$ 0 $\boxed{c}$ 1 $\boxed{d}$ 2	

King Abdul Aziz University	Faculty of Sciences	Mathematics Department
Math 110	Final Test Fall 2013 (40 Marks)	Time 120 m
Student Name:	Student Number:	$\boxed{C}$

1) $\lim\limits_{x\to 5^+} \dfrac{x+1}{x-5} =$

$\boxed{a}$ ∞ $\boxed{b}$ $-\infty$ $\boxed{c}$ 5 $\boxed{d}$ -5

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

$\boxed{a}$ 1 $\boxed{b}$ $\dfrac{1}{2}$ $\boxed{c}$ 0 $\boxed{d}$ $-\dfrac{1}{2}$

3) $y=-\ln(\cos x)$, then $y'=$

$\boxed{a}$ $\tan x$ $\boxed{b}$ $-\tan x$ $\boxed{c}$ $\cot x$ $\boxed{d}$ $-\cot x$

4) The absolute maximum value of $f(x)=x^3-6x^2+9x+2$ on $[0,4]$ is

$\boxed{a}$ 2 $\boxed{b}$ 12 $\boxed{c}$ 7 $\boxed{d}$ 6

5) The absolute minimum value of $f(x)=x^3-6x^2+9x+2$ on $[0,4]$ is

$\boxed{a}$ 6 $\boxed{b}$ 2 $\boxed{c}$ 0 $\boxed{d}$ -3

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

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

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

$\boxed{a}$ $1+\ln x$ $\boxed{b}$ $x^x(1+\ln x)$ $\boxed{c}$ x^x $\boxed{d}$ $x^x\ln x$

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

$\boxed{a}$ $\dfrac{2x+y}{3x-2y}$ $\boxed{b}$ $\dfrac{2x}{y}$ $\boxed{c}$ $\dfrac{2x}{3-2y}$ $\boxed{d}$ $\dfrac{3y-2x}{2y-3x}$

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

$\boxed{a}$ $y=2x$ $\boxed{b}$ $y=-2x+1$ $\boxed{c}$ $y=-2x$ $\boxed{d}$ $y=2x-1$

10) If $y=3^x\cot x$, then $y'=$

$\boxed{a}$ $3^x\ln 3\cot x-3^x\csc^2 x$ $\boxed{b}$ $3^x\cot x+3^x\sec^2 x$

$\boxed{c}$ $3^x\cot x-3^x\csc^2 x$ $\boxed{d}$ $3^x\ln 3\cot x+3^x\sec^2 x$

11) $D^{(126)}(\cos x)=$

$\boxed{a}$ $\sin x$ $\boxed{b}$ $-\sin x$ $\boxed{c}$ $\cos x$ $\boxed{d}$ $-\cos x$

12) If $f(x)=2x-5$, then $f^{-1}(x)=$			
$\boxed{a}$ $\dfrac{x+5}{2}$	$\boxed{b}$ $\dfrac{x}{2}-5$	$\boxed{c}$ $\dfrac{x-5}{2}$	$\boxed{d}$ $\dfrac{x}{2}+5$
13) The slope of the perpendicular line to the line $3y+2x-6=0$ is			
$\boxed{a}$ $\dfrac{2}{3}$	$\boxed{b}$ $-\dfrac{2}{3}$	$\boxed{c}$ $-\dfrac{3}{2}$	$\boxed{d}$ $\dfrac{3}{2}$
14) If the graph of the function $f(x)=3^x$ is shifted a distance 2 units downward, then the new graph represented the graph of the function			
$\boxed{a}$ 3^{x+2}	$\boxed{b}$ 3^x+2	$\boxed{c}$ 3^{x-2}	$\boxed{d}$ 3^x-2
15) If $y=\ln\dfrac{x+1}{x-2}$, then $y'=$			
$\boxed{a}$ $\dfrac{1}{(x+1)(x-2)}$	$\boxed{b}$ $-\dfrac{1}{(x+1)(x-2)}$	$\boxed{c}$ $\dfrac{3}{(x+1)(x-2)}$	$\boxed{d}$ $-\dfrac{3}{(x+1)(x-2)}$
16) $\lim\limits_{x\to 0}\dfrac{\sin 5x}{3x}=$			
$\boxed{a}$ $\dfrac{3}{5}$	$\boxed{b}$ $\dfrac{5}{3}$	$\boxed{c}$ $\dfrac{1}{3}$	$\boxed{d}$ 5
17) If $y=\left(2x^2+\sec x\right)^7$, then $y'=$			
$\boxed{a}$ $7\left(2x^2+\sec x\right)^6$		$\boxed{b}$ $7\left(2x^2+\sec x\right)^6\left(4x+\sec x\tan x\right)$	
$\boxed{c}$ $7\left(2x^2+\sec x\right)^6\left(4x-\sec x\tan x\right)$		$\boxed{d}$ $28x\left(2x^2+\sec x\right)^6$	
18) If $f(x)=x^2$, then $f'(x)=$			
$\boxed{a}$ $\lim\limits_{x\to 0}\dfrac{(x+h)^2+x^2}{h}$		$\boxed{b}$ $\lim\limits_{h\to 0}\dfrac{(x+h)^2-x^2}{h}$	
$\boxed{c}$ $\lim\limits_{h\to 0}\dfrac{(x+h)^2+x^2}{h}$		$\boxed{d}$ $\lim\limits_{x\to 0}\dfrac{(x+h)^2-x^2}{h}$	
19) $\dfrac{7\pi}{6}$ rad $=$			
$\boxed{a}$ 120^0	$\boxed{b}$ 150^0	$\boxed{c}$ 270^0	$\boxed{d}$ 210^0
20) If $y=\sin x\sec x$, then $y'=$			
$\boxed{a}$ $\sin x\tan x+1$	$\boxed{b}$ $\sin x\sec x\tan x-1$	$\boxed{c}$ $\sin x\tan x-1$	$\boxed{d}$ $\sec^2 x$

21) The values in $(-1,3)$ which makes $f(x)=x^2-5x+7$ satisfied Mean Value Theorem on $[-1,3]$ is $\boxed{a}$ -4 $\boxed{b}$ 1 $\boxed{c}$ 0 $\boxed{d}$ 2
22) The function $f(x)=\dfrac{x+1}{x^2-9}$ is continuous on $\boxed{a}$ $\{\pm 3\}$ $\boxed{b}$ $[-3,3]$ $\boxed{c}$ $(-\infty,-3)\cup(3,\infty)$ $\boxed{d}$ $\{x\in\mathbb{R}: x\neq\pm 3\}$
23) $\cos\left(\tan^{-1}x\right)=$ $\boxed{A}$ $\dfrac{1}{\sqrt{x^2+1}}$ $\boxed{B}$ $\dfrac{x}{\sqrt{x^2+1}}$ $\boxed{C}$ $\sqrt{x^2+1}$ $\boxed{D}$ $\dfrac{\sqrt{x^2+1}}{x}$
24) The distance between the points $(-1,2)$ and $(2,-1)$ is $\boxed{a}$ $3\sqrt{2}$ $\boxed{b}$ $2\sqrt{3}$ $\boxed{c}$ 9 $\boxed{d}$ 3
25) If $-7<2x+3\leq 5$, then $x=$ $\boxed{a}$ $(-5,1)$ $\boxed{b}$ $(-5,1]$ $\boxed{c}$ $[-5,1)$ $\boxed{d}$ $[-5,1]$
26) If $y=e^{2x}$, then $y^{(6)}=$ $\boxed{a}$ $128e^{2x}$ $\boxed{b}$ $16e^{2x}$ $\boxed{c}$ $64e^{2x}$ $\boxed{d}$ $32e^{2x}$
27) If $y=\sin^3(4x)$, then $y'=$ $\boxed{a}$ $4\cos^3(4x)$ $\boxed{b}$ $3\sin^2(4x)\cos(4x)$ $\boxed{c}$ $4\sin^3(4x)+12\sin^2 x\cos x$ $\boxed{d}$ $12\sin^2(4x)\cos(4x)$
28) The domain of $\dfrac{x+3}{\sqrt{x^2-4}}$ is $\boxed{a}$ $[-2,2]$ $\boxed{b}$ $(-\infty,-2)\cup(2,\infty)$ $\boxed{c}$ $(-2,2)$ $\boxed{d}$ $(-\infty,-2]\cup[2,\infty)$
29) $\lim\limits_{x\to 3}\dfrac{x^2-9}{x-3}=$ $\boxed{a}$ -6 $\boxed{b}$ 6 $\boxed{c}$ ∞ $\boxed{d}$ 0
30) If $y=\sqrt{3x^2+6x}$, then $y'=$ $\boxed{a}$ $\dfrac{x+6}{\sqrt{3x^2+6x}}$ $\boxed{b}$ $\dfrac{6(x+1)}{\sqrt{3x^2+6x}}$ $\boxed{c}$ $\dfrac{x+1}{2\sqrt{3x^2+6x}}$ $\boxed{d}$ $\dfrac{3(x+1)}{\sqrt{3x^2+6x}}$

31) If $y = \tan^{-1}\left(\frac{3x}{2}\right)$, then $y' =$

$\boxed{a}$ $-\frac{4}{4+9x^2}$ $\boxed{b}$ $\frac{6}{4+9x^2}$ $\boxed{c}$ $-\frac{6}{4+9x^2}$ $\boxed{d}$ $\frac{4}{4+9x^2}$

32) The critical numbers of the function $f(x) = 2x^3 - 3x^2 - 12x + 16$ are

$\boxed{a}$ $1, -2$ $\boxed{b}$ $-1, 2$ $\boxed{c}$ $1, 2$ $\boxed{d}$ $-1, -2$

33) The function $f(x) = 2x^3 - 3x^2 - 12x + 16$ is increasing on

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

34) The function $f(x) = 2x^3 - 3x^2 - 12x + 16$ is decreasing on

$\boxed{a}$ $(-2, -1)$ $\boxed{b}$ $(-2, 1)$ $\boxed{c}$ $(1, 2)$ $\boxed{d}$ $(-1, 2)$

35) The function $f(x) = 2x^3 - 3x^2 - 12x + 16$ has a relative maximum at

$\boxed{a}$ $(1, 3)$ $\boxed{b}$ $(-1, -23)$ $\boxed{c}$ $(2, -4)$ $\boxed{d}$ $(-2, 12)$

36) The function $f(x) = 2x^3 - 3x^2 - 12x + 16$ has a relative minimum at

$\boxed{a}$ $(1, 3)$ $\boxed{b}$ $(-1, -23)$ $\boxed{c}$ $(2, -4)$ $\boxed{d}$ $(-2, 12)$

37) The graph of $f(x) = 2x^3 - 3x^2 - 12x + 16$ concave upward on

$\boxed{a}$ $(-\infty, \frac{1}{2})$ $\boxed{b}$ $(-\infty, -\frac{1}{2})$ $\boxed{c}$ $(-\frac{1}{2}, \infty)$ $\boxed{d}$ $(\frac{1}{2}, \infty)$

38) The graph of $f(x) = 2x^3 - 3x^2 - 12x + 16$ concave downward on

$\boxed{a}$ $(-\infty, \frac{1}{2})$ $\boxed{b}$ $(-\infty, -\frac{1}{2})$ $\boxed{c}$ $(-\frac{1}{2}, \infty)$ $\boxed{d}$ $(\frac{1}{2}, \infty)$

39) The function $f(x) = 2x^3 - 3x^2 - 12x + 16$ has an inflection at

$\boxed{a}$ $(\frac{1}{2}, 21)$ $\boxed{b}$ $(-\frac{1}{2}, 21)$ $\boxed{c}$ $(\frac{1}{2}, \frac{19}{2})$ $\boxed{d}$ $(-\frac{1}{2}, \frac{19}{2})$

40) If $y = \log_5(x^3 - 2\csc x)$, then $y' =$

$\boxed{a}$ $\frac{3x^2 + 2\csc x \cot x}{x^3 - 2\csc x \ln 5}$ $\boxed{b}$ $\frac{3x^2 + 2\csc x \cot x}{\left(x^3 - 2\csc x\right)\ln 5}$

$\boxed{c}$ $\frac{3x^2 + 2\csc x \cot x}{x^3 - 2\csc x}$ $\boxed{d}$ $\frac{3x^2 - 2\csc x \cot x}{\left(x^3 - 2\csc x\right)\ln 5}$

King Abdul Aziz University	Faculty of Sciences	Mathematics Department
Math 110	Final Test Fall 2013 (40 Marks)	Time 120 m
Student Name:	Student Number:	$\boxed{D}$

1) If $y = -\ln(\sin x)$, then $y' =$

$\boxed{a}$ $\tan x$ $\boxed{b}$ $-\tan x$ $\boxed{c}$ $\cot x$ $\boxed{d}$ $-\cot x$

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

$\boxed{a}$ $1+\ln x$ $\boxed{b}$ x^x $\boxed{c}$ $x^x \ln x$ $\boxed{d}$ $x^x(1+\ln x)$

3) If $y = \cot^{-1}\left(\frac{3x}{2}\right)$, then $y' =$

$\boxed{a}$ $-\frac{4}{4+9x^2}$ $\boxed{b}$ $\frac{6}{4+9x^2}$ $\boxed{c}$ $-\frac{6}{4+9x^2}$ $\boxed{d}$ $\frac{4}{4+9x^2}$

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

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

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

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

$\boxed{a}$ $y = -2x - 1$ $\boxed{b}$ $y = -2x$

$\boxed{c}$ $y = 2x$ $\boxed{d}$ $y = 2x + 1$

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

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

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

$\boxed{a}$ $3^x \ln 3 \tan x - 3^x \sec^2 x$ $\boxed{b}$ $3^x \tan x - 3^x \sec^2 x$

$\boxed{c}$ $3^x \ln 3 \tan x + 3^x \sec^2 x$ $\boxed{d}$ $3^x \tan x + 3^x \sec^2 x$

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

$\boxed{a}$ $28x\left(2x^2+\csc x\right)^6$ $\boxed{b}$ $7\left(2x^2+\csc x\right)^6$

$\boxed{c}$ $7\left(2x^2+\csc x\right)^6(4x+\csc x \cot x)$ $\boxed{d}$ $7\left(2x^2+\csc x\right)^6(4x-\csc x \cot x)$

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

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

10) $D^{(128)}(\cos x) =$

$\boxed{a}$ $\sin x$ $\boxed{b}$ $-\sin x$ $\boxed{c}$ $\cos x$ $\boxed{d}$ $-\cos x$

11) If $y = \sqrt{3x^2 - 6x}$, then $y' =$

$\boxed{a}$ $\dfrac{6(x-1)}{\sqrt{3x^2-6x}}$ $\boxed{b}$ $\dfrac{x-6}{\sqrt{3x^2-6x}}$ $\boxed{c}$ $\dfrac{3(x-1)}{\sqrt{3x^2-6x}}$ $\boxed{d}$ $\dfrac{x-1}{2\sqrt{3x^2-6x}}$

12) If $y = \ln\dfrac{x+1}{x-2}$, then $y' =$

$\boxed{a}$ $\dfrac{1}{(x+1)(x-2)}$ $\boxed{b}$ $-\dfrac{1}{(x+1)(x-2)}$ $\boxed{c}$ $\dfrac{3}{(x+1)(x-2)}$ $\boxed{d}$ $-\dfrac{3}{(x+1)(x-2)}$

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

$\boxed{a}$ $-\infty$ $\boxed{b}$ -3 $\boxed{c}$ ∞ $\boxed{d}$ 3

14) If the graph of the function $f(x) = 3^x$ is shifted a distance 2 units to the left, then the new graph represented the graph of the function

$\boxed{a}$ 3^{x+2} $\boxed{b}$ $3^x + 2$ $\boxed{c}$ 3^{x-2} $\boxed{d}$ $3^x - 2$

15) If $f(x) = x^2$, then $f'(x) =$

$\boxed{a}$ $\lim\limits_{x \to 0} \dfrac{(x+h)^2 + x^2}{h}$ $\boxed{b}$ $\lim\limits_{h \to 0} \dfrac{(x+h)^2 + x^2}{h}$

$\boxed{c}$ $\lim\limits_{h \to 0} \dfrac{(x+h)^2 - x^2}{h}$ $\boxed{d}$ $\lim\limits_{x \to 0} \dfrac{(x+h)^2 - x^2}{h}$

16) If $y = \log_5(x^3 - 2\csc x)$, then $y' =$

$\boxed{a}$ $\dfrac{3x^2 + 2\csc x \cot x}{x^3 - 2\csc x \ln 5}$ $\boxed{b}$ $\dfrac{3x^2 - 2\csc x \cot x}{\left(x^3 - 2\csc x\right)\ln 5}$

$\boxed{c}$ $\dfrac{3x^2 + 2\csc x \cot x}{x^3 - 2\csc x}$ $\boxed{d}$ $\dfrac{3x^2 + 2\csc x \cot x}{\left(x^3 - 2\csc x\right)\ln 5}$

17) $\lim\limits_{x \to 0} \dfrac{\tan 3x}{5x} =$

$\boxed{a}$ $\dfrac{1}{5}$ $\boxed{b}$ $\dfrac{5}{3}$ $\boxed{c}$ $\dfrac{3}{5}$ $\boxed{d}$ 3

18) $\lim\limits_{x \to 2} \dfrac{x^2 - 4}{x - 2} =$

$\boxed{a}$ ∞ $\boxed{b}$ 0 $\boxed{c}$ 4 $\boxed{d}$ $\dfrac{1}{4}$

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

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

20) $\dfrac{3\pi}{2}$ rad $=$

$\boxed{a}$ 120^0 $\boxed{b}$ 150^0 $\boxed{c}$ 270^0 $\boxed{d}$ 210^0

21) The absolute minimum value of $f(x) = x^3 - 6x^2 + 9x + 2$ on $[0,4]$ is

$\boxed{a}$ 6 $\boxed{b}$ 0 $\boxed{c}$ -3 $\boxed{d}$ 2

22) The absolute maximum value of $f(x) = x^3 - 6x^2 + 9x + 2$ on $[0,4]$ is

$\boxed{a}$ 7 $\boxed{b}$ 2 $\boxed{c}$ 6 $\boxed{d}$ 12

23) The values in $(-1,3)$ which makes $f(x) = x^2 - 5x + 7$ satisfied Mean Value Theorem on $[-1,3]$ is

$\boxed{a}$ -4 $\boxed{b}$ 0 $\boxed{c}$ 2 $\boxed{d}$ 1

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

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

25) The function $f(x) = \dfrac{x+1}{x^2 - 25}$ is continuous on

$\boxed{a}$ $[-5,5]$ $\boxed{b}$ $\{x \in \mathbb{R} : x \neq \pm 5\}$ $\boxed{c}$ $(-\infty,-5)\cup(5,\infty)$ $\boxed{d}$ $\{\pm 5\}$

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

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

27) If $y = e^{2x}$, then $y^{(7)} =$

$\boxed{a}$ $128e^{2x}$ $\boxed{b}$ $16e^{2x}$ $\boxed{c}$ $64e^{2x}$ $\boxed{d}$ $32e^{2x}$

28) If $-7 < 2x + 3 < 5$, then $x =$

$\boxed{a}$ $(-5,1)$ $\boxed{b}$ $(-5,1]$ $\boxed{c}$ $[-5,1)$ $\boxed{d}$ $[-5,1]$

29) If $y = \cos x \csc x$, then $y' =$

$\boxed{a}$ $-1 + \cos x \cot x$ $\boxed{b}$ $1 - \cos x \cot x$ $\boxed{c}$ $-\csc^2 x$ $\boxed{d}$ $1 - \cos x \csc x \cot x$

30) The critical numbers of the function $f(x)=2x^3+3x^2-12x+16$ are			
$\boxed{a}$ $1,-2$	$\boxed{b}$ $-1,2$	$\boxed{c}$ $1,2$	$\boxed{d}$ $-1,-2$
31) The function $f(x)=2x^3+3x^2-12x+16$ is increasing on			
$\boxed{a}$ $(-\infty,-2)\cup(-1,\infty)$	$\boxed{b}$ $(-\infty,-2)\cup(1,\infty)$	$\boxed{c}$ $(-\infty,-1)\cup(2,\infty)$	$\boxed{d}$ $(-\infty,1)\cup(2,\infty)$
32) The function $f(x)=2x^3+3x^2-12x+16$ is decreasing on			
$(-\infty,-1)\cup(2,\infty)$	$\boxed{b}$ $(-\infty,-2)\cup(1,\infty)$	$\boxed{c}$ $(-2,1)$	$\boxed{d}$ $(-1,2)$
33) The function $f(x)=2x^3-3x^2-12x+15$ has a relative maximum at			
$\boxed{a}$ $(1,9)$	$\boxed{b}$ $(-1,29)$	$\boxed{c}$ $(2,20)$	$\boxed{d}$ $(-2,36)$
34) The function $f(x)=2x^3+3x^2-12x+16$ has a relative minimum at			
$\boxed{a}$ $(1,9)$	$\boxed{b}$ $(-1,29)$	$\boxed{c}$ $(2,20)$	$\boxed{d}$ $(-2,36)$
35) The graph of $f(x)=2x^3+3x^2-12x+16$ concave upward on			
$\boxed{a}$ $(-\infty,\frac{1}{2})$	$\boxed{b}$ $(-\infty,-\frac{1}{2})$	$\boxed{c}$ $(-\frac{1}{2},\infty)$	$\boxed{d}$ $(\frac{1}{2},\infty)$
36) The graph of $f(x)=2x^3-3x^2-12x+15$ concave downward on			
$\boxed{a}$ $(-\infty,\frac{1}{2})$	$\boxed{b}$ $(-\infty,-\frac{1}{2})$	$\boxed{c}$ $(-\frac{1}{2},\infty)$	$\boxed{d}$ $(\frac{1}{2},\infty)$
37) The function $f(x)=2x^3+3x^2-12x+16$ has an inflection at			
$\boxed{a}$ $(\frac{1}{2},11)$	$\boxed{b}$ $(-\frac{1}{2},11)$	$\boxed{c}$ $(\frac{1}{2},\frac{45}{2})$	$\boxed{d}$ $(-\frac{1}{2},\frac{45}{2})$
38) $\lim\limits_{x\to\infty}\left(\sqrt{x^2+x}-x\right)=$			
$\boxed{a}$ $\frac{1}{2}$	$\boxed{b}$ 1	$\boxed{c}$ 0	$\boxed{d}$ $-\frac{1}{2}$
39) $\sin\left(\tan^{-1}x\right)=$			
$\boxed{A}$ $\frac{1}{\sqrt{x^2+1}}$	$\boxed{B}$ $\frac{x}{\sqrt{x^2+1}}$	$\boxed{C}$ $\sqrt{x^2+1}$	$\boxed{D}$ $\frac{\sqrt{x^2+1}}{x}$
40) If $f(x)=2x+11$, then $f^{-1}(x)=$			
$\boxed{a}$ $\frac{x+11}{2}$	$\boxed{b}$ $\frac{x-11}{2}$	$\boxed{c}$ $\frac{x}{2}+11$	$\boxed{d}$ $\frac{x}{2}-11$