

C

King Abdul Aziz University Faculty of Sciences Mathematics Department
Math 110 Second Test Spring 2012 (30 Marks) Time 90 m
Student Name: Student Number: C

1) $\lim_{x \rightarrow 2} \frac{x^2 + x - 6}{x^2 - x - 2} =$

A $\frac{3}{5}$

B $\frac{5}{3}$

C 1

D does not exist

2) $\cos\left(\sin^{-1}\frac{x}{2}\right) =$

A $\frac{x}{\sqrt{4-x^2}}$

B $\frac{2}{\sqrt{4-x^2}}$

C $\frac{\sqrt{4-x^2}}{2}$

D $\frac{\sqrt{4-x^2}}{x}$

3) If $\lim_{x \rightarrow k} f(x) = \frac{2}{5}$ and $\lim_{x \rightarrow k} g(x) = -\frac{1}{2}$, then $\lim_{x \rightarrow k} \frac{f(x)}{g(x)} =$

A $-\frac{4}{5}$

B $-\frac{5}{4}$

C $\frac{1}{2}$

D $-\frac{1}{2}$

4) If $3^{x^2+5x+8} = 9$, then $x =$

A -6 or -1

B 1 or 6

C 2 or 3

D -3 or -2

5) $\lim_{x \rightarrow 3} \frac{x-3}{3^{-1}-x^{-1}} =$

A $-\frac{1}{9}$

B $\frac{1}{9}$

C -9

D 9

6) If $\lim_{x \rightarrow 1} \frac{f(x) + 3x}{x^2 - 5f(x)} = 1$, then $\lim_{x \rightarrow 1} f(x) =$

A $-\frac{1}{3}$

B -1

C $-\frac{2}{3}$

D 3

7) $\sin^{-1}\left(\frac{\sqrt{2}}{2}\right) =$

A $\frac{\pi}{2}$

B $\frac{\pi}{3}$

C $\frac{\pi}{4}$

D $\frac{\pi}{6}$

8) If $f(x) = \begin{cases} 2x+3 & ; x \geq -2 \\ 2x+5 & ; x < -2 \end{cases}$, then $\lim_{x \rightarrow (-2)^+} f(x) =$

A 3

B 5

C 1

D -1

9) $\lim_{x \rightarrow 5} \frac{x-5}{x^3-125} =$

A $\frac{1}{75}$

B 75

C 50

D does not exist

10) $\lim_{x \rightarrow 0} \frac{\sqrt{x+9} - 3}{x} =$			
☐ A -6	☐ B $-\frac{1}{6}$	☐ C 6	☐ D $\frac{1}{6}$
11) $\lim_{x \rightarrow 0} (\sin^2 x + 3 \tan x - 2) =$			
☐ A -2	☐ B does not exist	☐ C 0	☐ D 1
12) Find the domain of the function $f(x) = \sin^{-1}(x - 3)$.			
☐ A $[-4, -2]$	☐ B $(2, 4)$	☐ C $(-4, -2)$	☐ D $[2, 4]$
13) $\lim_{x \rightarrow \infty} \frac{9x^2 - 4x + 5}{3x^2 + 8x - 3} =$			
☐ A 0	☐ B 9	☐ C 3	☐ D ∞
14) $\lim_{x \rightarrow -2} (2x^3 + 3x^2 + 5) =$			
☐ A -11	☐ B 5	☐ C -1	☐ D 1
15) If $\alpha = \tan^{-1}\left(\frac{1}{7}\right)$, then $\sec \alpha =$			
☐ A $\frac{7}{5\sqrt{2}}$	☐ B $5\sqrt{2}$	☐ C $\frac{1}{5\sqrt{2}}$	☐ D $\frac{5\sqrt{2}}{7}$
16) $\lim_{x \rightarrow 2^-} \frac{5x - 3}{x - 2} =$			
☐ A ∞	☐ B $-\infty$	☐ C $\frac{1}{2}$	☐ D 0
17) $\lim_{x \rightarrow \sqrt{3}} \frac{x - \sqrt{3}}{x^2 - 3} =$			
☐ A $\frac{1}{2\sqrt{3}}$	☐ B $\sqrt{3}$	☐ C $\frac{1}{\sqrt{3}}$	☐ D $2\sqrt{3}$
18) The number c that makes $f(x) = \begin{cases} x+2 & : x > -1 \\ 2x-c & ; x \leq -1 \end{cases}$ is continuous at -1 is			
☐ A -5	☐ B -3	☐ C 4	☐ D -2
19) Find the inverse of the function $f(x) = \frac{x+9}{x-2}$.			
☐ A $f^{-1}(x) = \frac{2x+9}{x-1}$		☐ B $f^{-1}(x) = \frac{x-2}{x+9}$	
☐ C $f^{-1}(x) = \frac{2x-9}{x-1}$		☐ D $f^{-1}(x) = \frac{2x+9}{x+1}$	

20)	If $\ln(x+2)=7$, then $x=$			
☐ A	7	☐ B	e^7	☐ C e^7-2 ☐ D e^7+2
21)	If $x-1 \leq f(x) \leq \frac{x^2+1}{x-1}$, then $\lim_{x \rightarrow 0} f(x) =$			
☐ A	-1	☐ B	does not exist	☐ C 0 ☐ D 1
22)	Find the domain of the function $f(x) = \frac{7}{5-e^x}$.			
☐ A	$\mathbb{R} \setminus \{0\}$	☐ B	$\mathbb{R}$	☐ C $\mathbb{R} \setminus \{\ln 5\}$ ☐ D $\mathbb{R} \setminus \{\ln 7\}$
23)	$\lim_{x \rightarrow 0} \frac{\sin(3x)}{\tan(2x)} =$			
☐ A	3	☐ B	$\frac{2}{3}$	☐ C $\frac{3}{2}$ ☐ D 2
24)	$\lim_{x \rightarrow -1} \frac{x^3+3x}{8-2x}$			
☐ A	$\frac{2}{5}$	☐ B	$-\frac{2}{5}$	☐ C $-\frac{1}{4}$ ☐ D does not exist
25)	$\lim_{x \rightarrow (\pi/2)^-} \tan x =$			
☐ A	0	☐ B	$-\infty$	☐ C ∞ ☐ D $\frac{\pi}{2}$
26)	Find the range of the function $f(x) = -3^x + 2$.			
☐ A	$(2, \infty)$	☐ B	$(-\infty, 2)$	☐ C $(-2, \infty)$ ☐ D $(-\infty, -2)$
27)	The function $f(x) = \frac{x+2}{\sqrt{1-x^2}}$ is continuous on			
☐ A	$[-1, 1]$	☐ B	$(-1, 1)$	☐ C $(-\infty, -1) \cup (1, \infty)$ ☐ D $(-\infty, -1] \cup [1, \infty)$
28)	$\lim_{x \rightarrow 7^+} \frac{ x-7 }{x-7} =$			
☐ A	does not exist	☐ B	0	☐ C 1 ☐ D -1
29)	The inverse of the function $f = \{(0, 3), (2, 1), (3, 4), (5, -2), (1, 7)\}$ is			
☐ A	$f^{-1} = \{(3, 0), (1, 2), (4, 3), (-2, 5), (7, 1)\}$			
☐ B	$f^{-1} = \{(0, 3), (1, 2), (4, 3), (-2, 5), (7, 1)\}$			
☐ C	$f^{-1} = \{(2, 1), (3, 4), (5, -2), (1, 7), (0, 3)\}$			
☐ D	$f^{-1} = \{(0, 3), (2, 1), (4, 3), (-2, 5), (7, 1)\}$			
30)	$\log_5(125) - \log_2(128) - \log_2(512) =$			
☐ A	13	☐ B	-13	☐ C -5 ☐ D 5