



King Abdul Aziz University
Faculty of Sciences
Mathematics Department

Spring 2014 Second Exam
Calculus I- Math 110
Allowed Time: 90 M

لا يُسمح باستخدام الآلة الحاسبة الإلكترونية ولا الجوال

D

Name:

ID:

تعليمات هامة:

تستطيع – بمشيئة الله – تحقيق أفضل نتيجة من خلال إتباع التعليمات الآتية:

□ يجب أن يكون نموذج الإجابة الذي أمامك هو D

□ التأكد من أن عدد أسئلة الاختبار 30 سؤالاً.

□ كتابة البيانات وتظليل الرقم الجامعي بطريقة صحيحة.

□ احرص ما أمكن على التسلسل في الإجابة ، اجابة السؤال الأول ثم الثاني وهكذا.

□ التأكد من اجابتك قبل تظليلها.

□ ركز على رقم السؤال الذي ستظلل اجابته و الحرف الذي يحمل الإجابة الصحيحة ، وتظليل اجابة

واحدة فقط ولن يسمح بالتظليل بعد انتهاء الوقت المحدد.

Q.1	If $\frac{x}{1-(x-1)^2} \leq f(x) \leq x + \frac{1}{2}$, then $\lim_{x \rightarrow 0} f(x) =$						
(A)	2	(B)	$-\frac{1}{2}$	(C)	$\frac{1}{2}$	(D)	-2

Q.2	$\lim_{x \rightarrow 0} \frac{x}{1-(x-1)^2} =$						
(A)	2	(B)	$-\frac{1}{2}$	(C)	$\frac{1}{2}$	(D)	- 2

Q.3	$\lim_{x \rightarrow 0} \frac{\sin\left(\frac{2}{3}x\right)}{\sin\left(\frac{7}{5}x\right)} =$						
(A)	$\frac{10}{21}$	(B)	$\frac{14}{15}$	(C)	$\frac{15}{14}$	(D)	$\frac{21}{10}$

Q.4	Let $f(x) = x + 2$ and $g(x) = x - 2$. Find the domain of $h(x) = \sqrt{\frac{f(x)}{g(x)}}$.						
(A)	$(2, \infty)$	(B)	$(-\infty, -2) \cup [2, \infty)$	(C)	$[-2, 2)$	(D)	$(-\infty, -2] \cup (2, \infty)$

Q.5	$\log_3(27) - \log_3(81) + \log_3(\sqrt{3^5}) - \log_3(1) =$						
(A)	$\frac{9}{2}$	(B)	$-\frac{7}{2}$	(C)	$\frac{3}{2}$	(D)	$-\frac{3}{2}$

Q.6	$\lim_{x \rightarrow 1} \frac{x^2 + x - 2}{x^2 + 2x - 3} =$						
(A)	$\frac{5}{3}$	(B)	$\frac{4}{3}$	(C)	$\frac{3}{5}$	(D)	$\frac{3}{4}$

Q.7	$\lim_{x \rightarrow \frac{\pi}{4}} \left(\frac{\cos x - \sin x}{\cos^2 x - \sin^2 x} \right) =$						
(A)	$\sqrt{2}$	(B)	$-\sqrt{2}$	(C)	$\frac{1}{\sqrt{2}}$	(D)	$-\frac{1}{\sqrt{2}}$

Q.8	$\cos\left(2\cot^{-1}\left(\frac{2}{3}\right)\right) =$ [Hint: $\cos(2x) = \cos^2 x - \sin^2 x$]					
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(A)	$\frac{5}{13}$	(B)	$-\frac{5}{13}$	(C)	$\frac{2}{\sqrt{13}}$	(D)	$\frac{3}{\sqrt{13}}$
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Q.9	Find the inverse of the function $f(x) = \sqrt{(2x+3)^7}$.						
(A)	$f^{-1}(x) = \frac{\sqrt[7]{x^2-3}}{2}$	(B)	$f^{-1}(x) = \sqrt[7]{(2x+3)^2}$				
(C)	$f^{-1}(x) = \frac{1}{\sqrt{(2x+3)^7}}$	(D)	$f^{-1}(x) = \frac{\sqrt[7]{x^2+3}}{2}$				

Q.10	The number k that makes $f(x) = \begin{cases} kx^2 - 3x - 3 & : x \geq 1 \\ 7kx - 2 & ; x < 1 \end{cases}$ continuous at 1 is						
(A)	$\frac{2}{3}$	(B)	$-\frac{3}{2}$	(C)	$\frac{3}{2}$	(D)	$-\frac{2}{3}$

Q.11	$\sin^{-1}\left(\frac{1}{\sqrt{2}}\right) =$						
(A)	$\frac{\pi}{3}$	(B)	$\frac{\pi}{2}$	(C)	$\frac{\pi}{6}$	(D)	$\frac{\pi}{4}$

Q.12	$\lim_{x \rightarrow \infty} \frac{6x^2 + x - 5}{2 + 3x^2} =$						
(A)	2	(B)	-2	(C)	3	(D)	-3

Q.13	Find the rang of the function $f(x) = 5 - 3^x$.						
(A)	$(5, \infty)$	(B)	$(-5, \infty)$	(C)	$(-\infty, 5)$	(D)	$(-\infty, -5)$

Q.14	Find the horizontal asymptote of the curve $f(x) = \frac{\sqrt{25x^2 - 2}}{2x - 6}$.						
(A)	$x = 3$	(B)	$y = \pm \frac{5}{2}$	(C)	$y = \pm 5$	(D)	$x = \pm \frac{5}{2}$

Q.15	If the graph of the function $\tan x^2$ is shifted a distance 3 units to the right, then the new graph represented the graph of the function						
(A)	$\tan(x^2 - 9)$	(B)	$\tan(x^2 + 9)$	(C)	$\tan(x^2 + 6x + 9)$	(D)	$\tan(x^2 - 6x + 9)$

Q.16	If $\alpha = \sin^{-1}\left(\frac{x-3}{7}\right)$, then $\sec \alpha =$						
(A)	$\frac{\sqrt{40-x^2+6x}}{7}$	(B)	$\frac{7}{\sqrt{40-x^2+6x}}$	(C)	$\frac{\sqrt{58-x^2-6x}}{7}$	(D)	$\frac{7}{\sqrt{58-x^2-6x}}$

Q.17	$\lim_{x \rightarrow 0^+} \frac{x^2 + x }{2x^3 + 5x} =$						
(A)	$\frac{1}{5}$	(B)	does not exist	(C)	$-\frac{1}{5}$	(D)	$\frac{0}{0}$

Q.18	Find the solution of the equation $3^{x^2+5x-2}=81$.						
(A)	$x = -3$ or $x = 2$	(B)	$x = -2$ or $x = 3$	(C)	$x = -1$ or $x = 6$	(D)	$x = -6$ or $x = 1$

Q.19	$\lim_{x \rightarrow 7} \frac{7-x}{7^{-1}-x^{-1}} =$						
(A)	-14	(B)	49	(C)	-49	(D)	14

Q.20	Let $f(x) = \begin{cases} 3x - 7 & x > 3 \\ 2x - 1 & 2 \leq x \leq 3 \\ 5x - 4 & 2 < x \end{cases}$, then $\lim_{x \rightarrow 3^+} f(x) =$						
(A)	3	(B)	2	(C)	5	(D)	6

Q.21	The inverse of the function $f = \{(2,5), (-2,-1), (3,4), (0,1)\}$ is			
(A)	$f^{-1} = \{(-2,-1), (3,4), (0,1), (5,2)\}$	(B)	$f^{-1} = \{(5,2), (-2,-1), (4,3), (0,1)\}$	
(C)	$f^{-1} = \{(5,2), (-1,-2), (4,3), (1,0)\}$	(D)	$f^{-1} = \{(5,2), (-1,-2), (4,3), (0,1)\}$	

Q.22	Find the vertical asymptote of the curve $y = \frac{x - 1}{x^2 - 3x - 10}$.						
(A)	$y = -2, y = 5$	(B)	$y = -5, y = 2$	(C)	$x = -5, x = 2$	(D)	$x = -2, x = 5$

Q.23	$\log_3(10) =$						
(A)	$\frac{-\ln 5 - \ln 2}{\ln 3}$	(B)	$\frac{\ln 2 - \ln 5}{\ln 3}$	(C)	$\frac{\ln 5 - \ln 2}{\ln 3}$	(D)	$\frac{\ln 5 + \ln 2}{\ln 3}$

Q.24	The function $f(x) = \frac{x+1}{x^2-2x}$ is continuous at						
(A)	$[-2, 0]$	(B)	$[0, 2]$	(C)	$\mathbb{R} - \{0, 2\}$	(D)	$\mathbb{R} - \{-2, 0\}$

Q.25	Find the domain of the function $f(x) = \frac{x-3}{2+e^x}$.						
(A)	R	(B)	$\mathbf{R} - \{\ln(5)\}$	(C)	$(-3, \infty)$	(D)	$\mathbf{R} - \{\ln(-2)\}$

Q.26	The function $f(x) = \frac{x^3 + \sin x}{x - \tan x}$						
(A)	Even and odd	(B)	Odd	(C)	Even	(D)	Niether even nor odd

Q.27	Find the domain of the function $f(x) = \sin^{-1}(2x - 3)$.						
(A)	$[1, 2]$	(B)	$(-\infty, 1] \cup [2, \infty)$	(C)	$\mathbf{R}$	(D)	$(1, 2)$

Q.28	Let $f(x) = \ln(x - 2)$ and $g(x) = 2x - 8$. Find the domain of $f \circ g$.						
(A)	R	(B)	$(0, \infty)$	(C)	$[5, \infty)$	(D)	$(5, \infty)$

Q.29	$\lim_{x \rightarrow 2} \frac{\sqrt{x+7}-3}{x-2} =$						
(A)	$\frac{0}{0}$	(B)	$\frac{1}{6}$	(C)	does not exist	(D)	6

Q.30	$\lim_{x \rightarrow -2} (x^3 + 2x + 3) =$						
(A)	-5	(B)	-1	(C)	-9	(D)	-7