



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

C

Name:

ID:

تعليمات هامة:

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

□ يجب أن يكون نموذج الإجابة الذي أمامك هو C

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

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

Q.3	If the graph of the function $\sin x^2$ is shifted a distance 4 units to the left, then the new graph represented the graph of the function						
(A)	$\sin(x^2 + 8x + 16)$	(B)	$\sin(x^2 - 8x + 16)$	(C)	$\sin(x^2 - 16)$	(D)	$\sin(x^2 + 16)$

Q.4	Find the vertical asymptote of the curve $y = \frac{x - 1}{x^2 + 9x - 10}$.						
(A)	$x = -10, x = 1$	(B)	$x = -1, x = 10$	(C)	$y = -1, y = 10$	(D)	$y = -10, y = 1$

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

Q.6	Find the horizontal asymptote of the curve $f(x) = \frac{\sqrt{4x^2 - 2}}{3x - 6}$.						
(A)	$y = \pm \frac{2}{3}$	(B)	$x = 2$	(C)	$x = \pm \frac{2}{3}$	(D)	$y = \pm 2$

Q.7	Find the solution of the equation $3^{x^2+x-2}=81$.						
(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.8	$\lim_{x \rightarrow 1} \frac{x-1}{\sqrt{x+3}-2} =$						
(A)	4	(B)	does not exist	(C)	$\frac{1}{4}$	(D)	$\frac{0}{0}$

Q.9	$\log_3(27) - \log_3(81) - \log_3(\sqrt{3^5}) - \log_3(1) =$					
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(A)	$\frac{9}{2}$	(B)	$-\frac{7}{2}$	(C)	$\frac{3}{2}$	(D)	$-\frac{3}{2}$
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Q.10	$\cos\left(2 \tan^{-1}\left(\frac{1}{2}\right)\right)=$ [Hint: $\cos(2x)=\cos^2 x -\sin^2 x$]						
(A)	$\frac{2}{\sqrt{5}}$	(B)	$\frac{1}{\sqrt{5}}$	(C)	$\frac{3}{5}$	(D)	$-\frac{3}{5}$

Q.11	$\lim_{x \rightarrow \infty} \frac{-6x^2 + x - 5}{3 + 2x^2} =$						
(A)	2	(B)	-2	(C)	3	(D)	-3

Q.12	The inverse of the function $f = \{(7, 2), (-2, -1), (3, 4), (0, 1)\}$ is					
(A)	$f^{-1} = \{(2, 7), (-1, -2), (4, 3), (1, 0)\}$	(B)	$f^{-1} = \{(7, 2), (-2, -1), (4, 3), (0, 1)\}$			
(C)	$f^{-1} = \{(-2, -1), (3, 4), (0, 1), (7, 2)\}$	(D)	$f^{-1} = \{(7, 2), (-1, -2), (4, 3), (0, 1)\}$			

Q.13	The function $f(x) = \frac{x^2 + \sec x}{x^2 + \cos x}$						
(A)	Even	(B)	Odd	(C)	Even and odd	(D)	Niether even nor odd

Q.14	Let $f(x) = \ln(x - 1)$ and $g(x) = 2x - 7$. Find the domain of $f \circ g$.						
(A)	$(4, \infty)$	(B)	$(0, \infty)$	(C)	$[4, \infty)$	(D)	$\mathbf{R}$

Q.15	If $\alpha = \sin^{-1}\left(\frac{x-3}{7}\right)$, then $\tan \alpha =$						
(A)	$\frac{\sqrt{58-x^2-6x}}{x-3}$	(B)	$\frac{x-3}{\sqrt{58-x^2-6x}}$	(C)	$\frac{\sqrt{40-x^2+6x}}{x-3}$	(D)	$\frac{x-3}{\sqrt{40-x^2+6x}}$

Q.16	$\lim_{x \rightarrow 5} \frac{x-5}{5^{-1}-x^{-1}} =$						
(A)	-10	(B)	-25	(C)	10	(D)	25

Q.17	The number k that makes $f(x) = \begin{cases} kx^2 - 3x - 1 & : x \geq 1 \\ 5kx + 2 & ; x < 1 \end{cases}$ continuous at 1 is						
(A)	$\frac{2}{3}$	(B)	$-\frac{3}{2}$	(C)	$\frac{3}{2}$	(D)	$-\frac{2}{3}$

Q.18	Find the inverse of the function $f(x) = \sqrt{(3x+2)^5}$.			
(A)	$f^{-1}(x) = \frac{1}{\sqrt{(3x+2)^5}}$	(B)	$f^{-1}(x) = \frac{\sqrt[5]{x^2+2}}{3}$	
(C)	$f^{-1}(x) = \frac{\sqrt[5]{x^2-2}}{3}$	(D)	$f^{-1}(x) = \sqrt[5]{(3x+2)^2}$	

Q.19	$\lim_{x \rightarrow 0} \frac{\sin\left(\frac{5}{7}x\right)}{\sin\left(\frac{2}{3}x\right)} =$				
(A)	$\frac{10}{21}$	(B)	$\frac{14}{15}$	(C)	$\frac{15}{14}$
(D)	$\frac{21}{10}$				

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 $\lim_{x \rightarrow 2^+} f(x) =$				
(A)	3	(B)	2	(C)	5
(D)	6				

Q.21	Find the domain of the function $f(x) = \cos^{-1}(2x-7)$.				
(A)	$\mathbf{R}$	(B)	$[3, 4]$	(C)	$(-\infty, 3] \cup [4, \infty)$
(D)	$(3, 4)$				

Q.22	$\lim_{x \rightarrow -2} (x^3 + 2x + 3) =$				
(A)	-5	(B)	-1	(C)	-9
(D)	-7				

Q.23	Find the domain of the function $f(x) = \frac{x-3}{5+e^x}$.				
(A)	$\mathbf{R} - \{\ln(5)\}$	(B)	$\mathbf{R} - \{\ln(-5)\}$	(C)	$(-3, \infty)$
(D)	$\mathbf{R}$				

Q.24	$\log_3\left(\frac{2}{5}\right) =$				
(A)	$\frac{-\ln 5 - \ln 2}{\ln 3}$	(B)	$\frac{\ln 5 - \ln 2}{\ln 3}$	(C)	$\frac{\ln 2 - \ln 5}{\ln 3}$
(D)	$\frac{\ln 5 + \ln 2}{\ln 3}$				

Q.25	$\lim_{x \rightarrow 0} \frac{x^2 + x }{2x^3 - 3x} =$				
(A)	does not exist	(B)	$\frac{1}{3}$	(C)	$\frac{0}{0}$
(D)	$-\frac{1}{3}$				

Q.26	If $\frac{x}{(x-1)^2-1} \leq f(x) \leq x - \frac{1}{2}$, then $\lim_{x \rightarrow 0} f(x) =$						
(A)	2	(B)	$\frac{1}{2}$	(C)	$-\frac{1}{2}$	(D)	-2

Q.27	$\lim_{x \rightarrow 0} \frac{x}{(x-1)^2-1} =$						
(A)	2	(B)	$-\frac{1}{2}$	(C)	$\frac{1}{2}$	(D)	-2

Q.28	Let $f(x) = x - 1$ and $g(x) = x + 1$. Find the domain of $h(x) = \sqrt{\frac{f(x)}{g(x)}}$.						
(A)	$(-\infty, -1) \cup [1, \infty)$	(B)	$[-1, \infty)$	(C)	$(-\infty, -1] \cup (1, \infty)$	(D)	$(-1, 1]$

Q.29	$\lim_{x \rightarrow 2} \frac{x^2 + x - 6}{x^2 - x - 2} =$						
(A)	$\frac{3}{4}$	(B)	$\frac{4}{3}$	(C)	$\frac{3}{5}$	(D)	$\frac{5}{3}$

Q.30	The function $f(x) = \frac{x+2}{x^2+x}$ is continuous at						
(A)	$[0,1]$	(B)	$\mathbb{R}-\{0,1\}$	(C)	$\mathbb{R}-\{-1,0\}$	(D)	$[-1,0]$