



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

B

Name:

ID:

تعليمات هامة:

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

- يجب أن يكون نموذج الإجابة الذي أمامك هو B
- 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	$\lim_{x \rightarrow 0^+} \frac{x^2 + x }{2x^3 - 3x} =$						
(A)	does not exist	(B)	$\frac{1}{3}$	(C)	$\frac{0}{0}$	(D)	$-\frac{1}{3}$

Q.2	If the graph of the function $\sin x^2$ is shifted a distance 4 units to the right, 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.3	$\cos^{-1}\left(\frac{\sqrt{3}}{2}\right)=$						
(A)	$\frac{\pi}{3}$	(B)	$\frac{\pi}{2}$	(C)	$\frac{\pi}{6}$	(D)	$\frac{\pi}{4}$

Q.4	$\lim_{x \rightarrow 5} \frac{5-x}{5^{-1}-x^{-1}} =$						
(A)	-10	(B)	-25	(C)	10	(D)	25

Q.5	The inverse of the function $f = \{(11, 3), (-2, -1), (5, 4), (9, 7)\}$ is					
(A)	$f^{-1} = \{(11, 3), (-2, -1), (4, 5), (7, 9)\}$	(B)	$f^{-1} = \{(11, 3), (-1, -2), (4, 5), (7, 9)\}$			
(C)	$f^{-1} = \{(-2, -1), (5, 4), (9, 7), (11, 3)\}$	(D)	$f^{-1} = \{(3, 11), (-1, -2), (4, 5), (7, 9)\}$			

Q.6	If $\frac{(x-1)^2-1}{x} \leq f(x) \leq x-2$, then $\lim_{x \rightarrow 0} f(x) =$						
(A)	2	(B)	$-\frac{1}{2}$	(C)	$\frac{1}{2}$	(D)	-2

Q.7	$\lim_{x \rightarrow 0} \frac{(x-1)^2 - 1}{x} =$						
(A)	2	(B)	$-\frac{1}{2}$	(C)	$\frac{1}{2}$	(D)	- 2

Q8	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.9	Find the rang of the function $f(x) = 3^x + 5$.						
(A)	$(-\infty, 5)$	(B)	$(-\infty, -5)$	(C)	$(5, \infty)$	(D)	$(-5, \infty)$

Q.10	$\lim_{x \rightarrow \infty} \frac{-6x^2 + x - 5}{2 + 3x^2} =$				
(A)	2	(B)	-2	(C)	3
		(D)	-3		

Q.11	$\lim_{x \rightarrow 2} \frac{x^2 - x - 2}{x^2 + x - 6} =$				
(A)	$\frac{5}{3}$	(B)	$\frac{4}{3}$	(C)	$\frac{3}{4}$
		(D)	$\frac{3}{5}$		

Q.12	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)	5	(C)	2
		(D)	6		

Q.13	$\cos\left(2\tan^{-1}\left(\frac{1}{2}\right)\right) =$ [Hint: $\cos(2x) = \cos^2 x - \sin^2 x$]				
(A)	$\frac{3}{5}$	(B)	$\frac{1}{\sqrt{5}}$	(C)	$\frac{2}{\sqrt{5}}$
		(D)	$-\frac{3}{5}$		

Q.14	$\log_3\left(\frac{5}{2}\right) =$				
(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.15	Let $f(x) = x + 1$ and $g(x) = x - 1$. Find the domain of $h(x) = \sqrt{\frac{f(x)}{g(x)}}$.				
(A)	$[-1, 1)$	(B)	$(1, \infty)$	(C)	$(-\infty, -1] \cup [1, \infty)$
		(D)	$(-\infty, -1] \cup (1, \infty)$		

Q.16	Find the horizontal asymptote of the curve $f(x) = \frac{\sqrt{9x^2 - 2}}{2x - 6}$.				
(A)	$y = \pm \frac{3}{2}$	(B)	$y = \pm 3$	(C)	$x = 3$
		(D)	$x = \pm \frac{3}{2}$		
Q.17	If $\alpha = \sin^{-1}\left(\frac{x-3}{7}\right)$, then $\cot \alpha =$				
(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.18	Find the domain of the function $f(x) = \frac{x-5}{3+e^x}$.					
(A)	$\mathbb{R} - \{\ln(3)\}$	(B)	$\mathbb{R} - \{\ln(-3)\}$	(C)	$(-5, \infty)$	(D) $\mathbb{R}$

Q.19	Find the domain of the function $f(x) = \cos^{-1}(2x - 5)$.					
(A)	$\mathbb{R}$	(B)	$[2, 3]$	(C)	$(2, 3)$	(D) $(-\infty, 2] \cup [3, \infty)$

Q.20	The function $f(x) = \frac{x+2}{x^2-x}$ is continuous at					
(A)	$\mathbb{R} - \{-1, 0\}$	(B)	$\mathbb{R} - \{0, 1\}$	(C)	$[0, 1]$	(D) $[-1, 0]$

Q.21	$\log_3(27) + \log_3(81) - \log_3(\sqrt{3^5}) - \log_3(1) =$					
(A)	$\frac{9}{2}$	(B)	$-\frac{7}{2}$	(C)	$\frac{3}{2}$	(D) $-\frac{3}{2}$

Q.22	$\lim_{x \rightarrow 0} \frac{\sin(\frac{2}{3}x)}{\sin(\frac{5}{7}x)} =$					
(A)	$\frac{10}{21}$	(B)	$\frac{14}{15}$	(C)	$\frac{15}{14}$	(D) $\frac{21}{10}$

Q.23	The number k that makes $f(x) = \begin{cases} kx^2 + 3x + 1 & ; x \leq 1 \\ 5kx - 2 & ; x > 1 \end{cases}$ continuous at 1 is					
(A)	$\frac{2}{3}$	(B)	$-\frac{3}{2}$	(C)	$\frac{3}{2}$	(D) $-\frac{2}{3}$

Q.24	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.25	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.26	$\lim_{x \rightarrow \frac{\pi}{4}} \left(\frac{\sin x - \cos x}{\sin^2 x - \cos^2 x} \right) =$					
(A)	$\frac{1}{\sqrt{2}}$	(B)	$-\frac{1}{\sqrt{2}}$	(C)	$\sqrt{2}$	(D) $-\sqrt{2}$

Q.27	The function $f(x) = \frac{x^3 + \sin x}{x^2 - \cos x}$					
(A)	Even	(B)	Odd	(C)	Even and odd	(D) Niether even nor odd

Q.28	Let $f(x) = \ln(x - 1)$ and $g(x) = 2x - 3$. Find the domain of $f \circ g$.					
(A)	$[2, \infty)$	(B)	$(0, \infty)$	(C)	$(2, \infty)$	(D) $\mathbf{R}$

Q.29	$\lim_{x \rightarrow 1} \frac{\sqrt{x+3} - 2}{x - 1} =$					
(A)	4	(B)	does not exist	(C)	$\frac{1}{4}$	(D) $\frac{0}{0}$

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