MAT127 Calculus C, Fall 2017

Early Exam

DO NOT OPEN THIS EXAM UNTIL INSTRUCTED TO DO SO

No books or notes, no calculators, phones or other devices may be used.
Please turn off your cell phone and put it away.
Only the exam and pens/pencils/erasers should be on your desk.
If you need extra paper, ask your proctors.

The exam consists of 20 multiple choice questions.

Please record your answers on the answer sheet.
Mark your answer CLEARLY by circling ONE letter per line.
If there is any ambiguity in what you circled, you will not receive any credit for the question.
(If you need to erase your answer, please erase it completely.)
You may work on the exam booklet but only the answer sheet will be collected and graded.

Please put your name and your SB ID number on your answer sheet now.

1. $\dfrac{2}{3^{-2}} + 1$ equals

(A) -17 (B) $\dfrac{5}{9}$ (C) $\dfrac{7}{9}$ (D) 19 (E) $\dfrac{2+\sqrt{3}}{\sqrt{3}}$

2. $\dfrac{\frac{1}{2}+\frac{2}{3}}{\frac{2}{3}+\frac{1}{4}}$ equals

(A) $\dfrac{1}{2}$ (B) $\dfrac{5}{8}$ (C) $\dfrac{14}{11}$ (D) $\dfrac{10}{9}$ (E) 2

3. $\sin\dfrac{5\pi}{6}$ equals

(A) $\dfrac{\sqrt{3}}{2}$ (B) $\dfrac{1}{2}$ (C) $-\dfrac{\sqrt{3}}{2}$ (D) $-\dfrac{\sqrt{2}}{2}$ (E) $-\dfrac{1}{2}$

4. $e^{\frac{1}{2}\ln 2}$ equals

(A) $\ln 2\sqrt{e}$ (B) $2-\sqrt{e}$ (C) $\dfrac{1}{2}$ (D) $\sqrt{2}$ (E) $\dfrac{\sqrt{e}}{2}$

5. If $\sqrt{(x-3)^2} > 1$, then

(A) $x > 4$ (B) $x < 2$ (C) $2 < x < 4$ (D) $x > 4$ or $x < 2$ (E) $x > -2$ or $x < -4$

6. If $a > b > 0$, then $\dfrac{\sqrt{a^2-b^2}}{a+b}$ equals

(A) $a-b$ (B) $\dfrac{a-b}{a+b}$ (C) $\sqrt{\dfrac{a-b}{a+b}}$ (D) $\dfrac{1}{\sqrt{a+b}}$ (E) $\dfrac{1}{\sqrt{a-b}}$

7. $\dfrac{1}{n^2-1} + \dfrac{2}{n-1}$ equals

(A) $\dfrac{2n+3}{n^2-1}$ (B) $\dfrac{3}{n^2+n-2}$ (C) $\dfrac{3}{n^2-1}$ (D) $\dfrac{2n+3}{n-1}$ (E) $\dfrac{3}{(n^2-1)(n-1)}$

8. The graph of $\ln(x-2)+5$ is obtained by shifting the graph of $\ln x$
(A) 2 units to the right, 5 units down
(B) 2 units to the left, 5 units down
(C) 2 units to the right, 5 units up
(D) 2 units to the left, 5 units down
(E) 2 units down, 5 units to the right

9. The solution of the linear system $\begin{cases} 3x+y=1 \\ x-2y=5 \end{cases}$ is

(A) $(3,-1)$ (B) $(2,1)$ (C) $(1,-2)$ (D) $(\frac{4}{3},-3)$ (E) $(-1,4)$

10. The expression $\frac{1}{3}-\frac{x}{5}+\frac{x^2}{7}-\frac{x^3}{9}+\frac{x^4}{11}$ equals

(A) $\sum_{n=0}^{4}\frac{(-1)^{n+1}}{2n+1}x^n$ (B) $\sum_{n=1}^{5}\frac{(-1)^{n}}{2n+1}x^n$ (C) $\sum_{n=0}^{4}\frac{(-1)^{n}}{2n+3}x^n$ (D) $\sum_{n=1}^{5}\frac{(-1)^{n+1}}{2n+1}x^n$ (E) $\sum_{n=3}^{11}\frac{(-1)^{n}}{n}x^n$

11. $\lim_{x\to 0}\frac{\tan x}{x}$ equals

(A) 1 (B) 0 (C) $+\infty$ (D) $\cos x$ (E) doesn't exist

12. $\lim_{x\to+\infty} 2^x 5^{-x} =$

(A) 1 (B) 0 (C) $+\infty$ (D) $\frac{2}{5}$ (E) doesn't exist

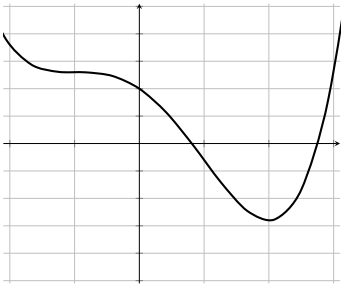
13. If $f(x)=3^x$, then $f'(x)$ equals

(A) 3^x (B) $x3^{x-1}$ (C) 3^{x-1} (D) $(\ln 3)3^x$ (E) $\frac{1}{\ln 3}3^x$

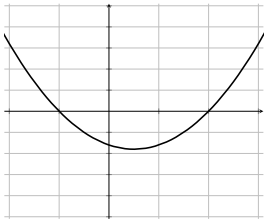
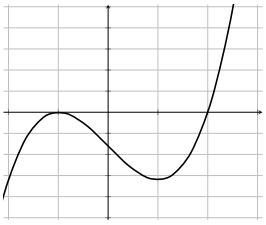
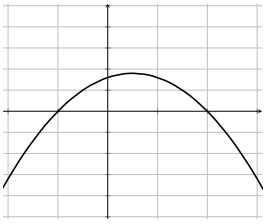
14. If $f(x) = x^2 \sin(2x)$, then $f'(x)$ equals

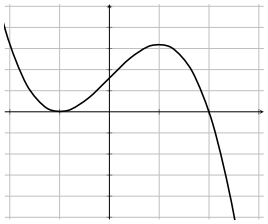
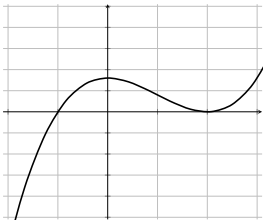
(A) $4x\cos(2x)$ (B) $2x + 2\cos(2x)$ (C) $2x^2\cos(2x)$ (D) $2x\sin(2x) + 2x^2\cos(2x)$
(E) $4x\sin(2x) + 2x^2\cos(2x)$

18. The graph of the function $f(x)$ is shown in the next figure.



The graph of the derivative of $f(x)$ is

(A) 
(B) 
(C) 

(D) 
(E) 

15. $\int 2xe^{x^2}dx$ equals

(A) $2e^{x^2} + C$ (B) $e^{x^2} + C$ (C) $x^2 + e^x + C$ (D) $e^{x^2} + e^x + C$ (E) $e^{x^2+x} + C$

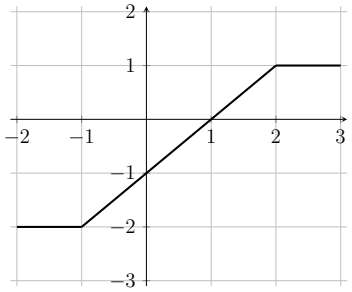
16. $\displaystyle\int_{-2}^{-1} \frac{dx}{x^{2/3}}$ equals

(A) $\sqrt[3]{2} - 1$ (B) $3 - 3\sqrt[3]{2}$ (C) $-3 + 3\sqrt[3]{2}$ (D) $\dfrac{3}{5}(2^{5/3} - 1)$ (E) diverges

17. $\displaystyle\int_1^{+\infty} \frac{dx}{\sqrt{x}}$ equals

(A) 1 (B) $\frac{1}{2}$ (C) 2 (D) $\frac{3}{2}$ (E) diverges

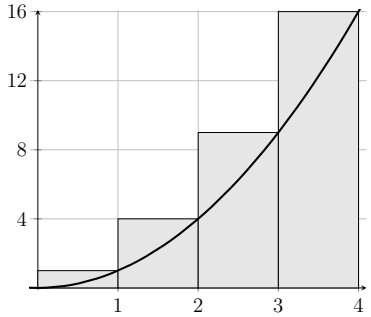
19. The graph of the function $g(x)$ on the interval $[-2, 3]$ is shown in the figure.



Then $\displaystyle\int_{-2}^{3} g(x)\,dx$ equals

(A) $-\frac{3}{2}$ (B) $-\frac{5}{2}$ (C) $\frac{11}{2}$ (D) 6 (E) -5

20. The sum of areas of rectangles shown in the figure represent a Riemann sum S for $\displaystyle\int_0^4 x^2\,dx$. Which of the following statements is correct?



(A) The Riemann sum S equals $0^2 + 1^2 + 2^2 + 3^2$ and is less than $\displaystyle\int_0^4 x^2\,dx$;

(B) The Riemann sum S equals $\frac{1}{4}(1^2 + 2^2 + 3^2 + 4^2)$ and is greater than $\displaystyle\int_0^4 x^2\,dx$;

(C) The Riemann sum S equals $\frac{1}{4}(0^2 + 1^2 + 2^2 + 3^2)$ and is less than $\displaystyle\int_0^4 x^2\,dx$;

(D) The Riemann sum S equals $1^2 + 2^2 + 3^2 + 4^2$ and is less than $\displaystyle\int_0^4 x^2\,dx$;

(E) The Riemann sum S equals $1^2 + 2^2 + 3^2 + 4^2$ and is greater than $\displaystyle\int_0^4 x^2\,dx$;