

MATH 220

Test 2

Fall 2018

Name _____

NetID _____

UIN _____

Circle your TA discussion section.

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|---|---|
| ▷ AD1 , TR 11:00-12:50, Adriana Morales | ▷ ADJ , TR 9:00-9:50, Gayana Jayasinghe |
| ▷ AD2 , TR 9:00-10:50, Hannah Burson | ▷ ADK , TR 10:00-10:50, Madina Bolat |
| ▷ AD3 , TR 1:00-2:50, Dana Neidinger | ▷ ADL , TR 11:00-11:50, Chris Loa |
| ▷ ADA , TR 8:00-8:50, Gayana Jayasinghe | ▷ ADM , TR 12:00-12:50, Heeyeon Kim |
| ▷ ADB , TR 9:00-9:50, Felix Clemen | ▷ ADN , TR 1:00-1:50, Josh Wen |
| ▷ ADC , TR 10:00-10:50, Lutian Zhao | ▷ ADO , TR 2:00-2:50, Kesav Krishnan |
| ▷ ADD , TR 11:00-11:50, Gidon Orelowitz | ▷ ADQ , TR 10:00-10:50, Felix Clemen |
| ▷ ADE , TR 12:00-12:50, Josh Wen | ▷ ADR , TR 9:00-9:50, Madina Bolat |
| ▷ ADF , TR 1:00-1:50, Nachiketa Adhikari | ▷ ADS , TR 12:00-12:50, Chris Loa |
| ▷ ADG , TR 2:00-2:50, Lutian Zhao | ▷ ADT , TR 2:00-2:50, Nachiketa Adhikari |
| ▷ ADH , TR 3:00-3:50, Stathis Chrontsios | ▷ ADU , TR 3:00-3:50, Kesav Krishnan |
| ▷ ADI , TR 4:00-4:50, Stathis Chrontsios | ▷ ADZ , TR 9:00-9:50, Gidon Orelowitz |

- Sit in your assigned seat (circled below).
- Do not open this test booklet until I say *START*.
- Turn off all electronic devices and put away all items except a pen/pencil and an eraser.
- Remove hats and sunglasses.
- There is no partial credit on multiple-choice questions. For all other questions, you must show sufficient work to justify your answer.
- While the test is in progress, we will not answer questions concerning the test material.
- Do not leave early unless you are at the end of a row.
- Quit working and close this test booklet when I say *STOP*.
- Quickly turn in your test to me or a TA and show your Student ID.

◊ ◊ ◊ ◊	Q1 Q2 Q3 Q4 P1 P2 P3 P4 N1 N2 N3 N4 N5 M1 M2 M3 M4 M5 L1 L2 L3 L4 L5 K1 K2 K3 K4 K5 J1 J2 J3 J4 J5 H1 H2 H3 H4 H5 G1 G2 G3 G4 G5 F1 F2 F3 F4 F5 E1 E2 E3 E4 E5 D1 D2 D3 D4 D5 C1 C2 C3 C4 C5 B1 B2 B3 B4 B5 A1 ◊ ◊ ◊ ◊	Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 P1 P2 P3 P4 P5 P6 P7 P8 P9 N1 N2 N3 N4 N5 N6 N7 N8 N9 N10 M1 M2 M3 M4 M5 M6 M7 M8 M9 M10 L1 L2 L3 L4 L5 L6 L7 L8 L9 L10 K1 K2 K3 K4 K5 K6 K7 K8 K9 K10 J1 J2 J3 J4 J5 J6 J7 J8 J9 J10 H1 H2 H3 H4 H5 H6 H7 H8 H9 H10 G1 G2 G3 G4 G5 G6 G7 G8 G9 G10 F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 B1 B2 B3 B4 B5 B6 B7 B8 B9 B10	R1 R2 R3 Q1 Q2 Q3 Q4 P1 P2 P3 P4 P5 N1 N2 N3 N4 N5 M1 M2 M3 M4 M5 L1 L2 L3 L4 L5 K1 K2 K3 K4 K5 J1 J2 J3 J4 J5 H1 H2 H3 H4 H5 G1 G2 G3 G4 G5 F1 F2 F3 F4 F5 E1 E2 E3 E4 E5 D1 D2 D3 D4 D5 C1 C2 C3 C4 C5 B1 B2 B3 B4 B5 ◊ ◊ ◊ ◊ A5
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1. (10 points) Find $w'(x)$ given that $w(x) = 5x^9e^{12x}$

2. (10 points) Find $g'(x)$ given that $g(x) = \frac{x^8 + 3\cos(x)}{x^4 + 5\sin(x)}$

3. (10 points) Find $f'(x)$ given that $f(x) = \cot(\ln(\sec(5x)))$

4. (10 points) Find $\frac{dy}{dx}$ and write your answer in terms of x given the function $y = (8x)^{(9/x)}$

5. (10 points) Find the slope of the line tangent to the curve $x^4y^2 = 75x - 2y$ at the point $(2, 3)$.

6. (10 points) Evaluate the following limit. Simplify your answer.

$$\lim_{x \rightarrow 0} \frac{e^{5x} - 5x - 1}{1 - \cos(9x)}$$

7. (10 points) Determine the x -coordinate for the absolute minimum value of the following function.

$$f(x) = 2 \ln(64x^2 + 1) - 320 \arctan(8x)$$

8. (10 points) A function $f(x)$ is differentiable everywhere and has the following second derivative.

$$f''(x) = \frac{(2x^2 - 288)(x + 3)^{42}(x^2 + 25)}{20e^{16-x}}$$

Find the intervals of concavity for $f(x)$ and state each x -value at which the graph of $f(x)$ has an inflection point.

9. (10 points) The curve $y = f(x)$ has the property that the slope of the curve is always equal to its y -coordinate multiplied by $1/4$. If the curve goes through the point $(\ln(81), 36)$, then find a formula for $f(x)$. Simplify your answer.

10. (10 points) A spherical balloon is being inflated so that its diameter is increasing at a constant rate of 6 cm/min . How quickly is the volume of the balloon increasing when the diameter is 50 cm ?

Students – do not write on this page!

1. (10 points) _____

2. (10 points) _____

3. (10 points) _____

4. (10 points) _____

5. (10 points) _____

6. (10 points) _____

7. (10 points) _____

8. (10 points) _____

9. (10 points) _____

10. (10 points) _____

TOTAL (100 points) _____