Math 124C **Midterm 1** **Winter 2018**

Your Name

Your Signature

Student ID #

	Rowan		Isaac	
Section (Tues.)	11:30	1:00	11:30	1:00
(circle one)	CA	CB	CC	CD

- Turn off all cell phones, pagers, radios, mp3 players, and other similar devices.
- This exam is closed book. You may use one $8.5'' \times 11''$ sheet of handwritten notes (both sides OK). Do not share notes. No photocopied materials are allowed.
- You can use only a Texas Instruments TI-30X IIS calculator.
- In order to receive credit, you must **show all of your work**. If you do not indicate the way in which you solved a problem, you may get little or no credit for it, even if your answer is correct.
- Place a box around your answer to each question.
- If you need more room, use the backs of the pages and indicate that you have done so.
- Raise your hand if you have a question.
- This exam has 4 pages, plus this cover sheet. Please make sure that your exam is complete.

Question	Points	Score
1	12	
2	7	
3	7	
4	8	
5	8	
6	8	
Total	50	

1. Determine if the following limits exist. If they exist, compute them. Justify your answers.

   (a) (4 points) $\lim_{x\to 2} \dfrac{x^2-4}{2x^2-3x-2}$

   (b) (4 points) $\lim_{t\to 0} \left(\dfrac{5}{3t^2+5t} - \dfrac{1}{t}\right)$

   (c) (4 points) $\lim_{x\to 2} \dfrac{\sqrt{3x-2}}{2x^2-7x+6}$

2. (7 points) Use the limit definition of the derivative on this problem. Find the slope of the tangent line to the curve $y = \sqrt{5x+1}$ at the point $(3,4)$.

3. (7 points) Calculate the equation of the tangent line to $f(t) = 7t^2 \cdot \sin(t)$ at $t = \pi$.

4. (8 points) Let c be a constant. Define $F(x)$ by the piecewise formula

$$F(x) = \begin{cases} cx^2 - 3x & \text{if } x \leq -1; \\ cx + 11 & \text{if } x > -1. \end{cases}$$

Find a value of c that makes F continuous on $(-\infty, \infty)$. Justify your answer. (Your justification should involve limits).

5. (8 points) Find **two** different points on the curve $y = x^3$ at which the tangent line passes through the point $(-2, 0)$.

6. (8 points) Find the equations of **all** tangent lines to the curve $y = \dfrac{5x-4}{2x-3}$ that are parallel to the line $7x+9y=2$.