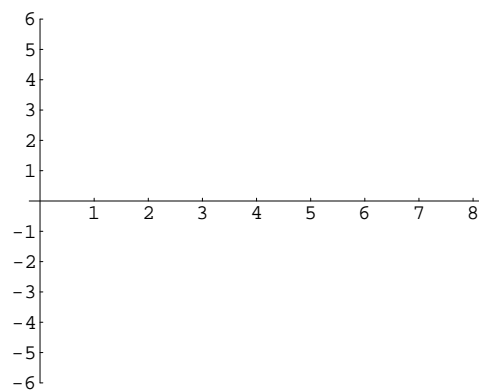


You have 20 minutes to take this quiz. Each problem will be graded for clarity of work as well as correctness, so show all work **clearly and in order**. Circle or otherwise indicate your final answers. Please note that there are problems on both the front and the back of this page.

1. (5 points) Use definite integrals to write down (but do not calculate) the area between the graphs of $f(x) = x^2$ and $g(x) = x + 2$ on $[-3, 3]$.

2. (5 points) Suppose $f(x)$ is a function whose average value on $[1, 7]$ is 4 and whose average rate of change on the same interval is -3 . Sketch a possible graph of $f(x)$, and illustrate graphically the average value and average rate of change.



Turn over for more...

3. (5 points) Find $\int \frac{x+1}{\sqrt{x}} dx$.

4. (5 points) Consider the definite integral $\int_1^4 x^2 dx$. Use sigma notation to express the Right Hand Sum that approximates this integral with N rectangles, in such a way that the only letters that appear in your sum are k and N .