Due by 9am on September 8. Please upload your solutions to Canvas as one PDF file. Do not forget to attach the honor code. Each problem is worth 10 points.

(1) Write the sum in summation (sigma) notation.
   (a) $4^7 + 5^7 + 6^7 + 7^7 + 8^7$
   (b) $\sqrt{1+1^3} + \sqrt{2+2^3} + \cdots + \sqrt{n+n^3}$
   (c) $(2^2+2) + (3^2+3) + (4^2+4) + (5^2+5)$
   (d) $(2^2+2) + (2^3+2) + (2^4+2) + (2^5+2)$
   (e) $\dfrac{1}{2\cdot 3} + \dfrac{2}{3\cdot 4} + \cdots + \dfrac{n}{(n+1)\cdot(n+2)}$

(2) Calculate the sums.

   (a) $\displaystyle\sum_{i=1}^{5} 9$
   (b) $\displaystyle\sum_{k=2}^{4} k^3$
   (c) $\displaystyle\sum_{j=3}^{4} \sin\left(j\frac{\pi}{2}\right)$
   (d) $\displaystyle\sum_{j=0}^{2} 3^{j-1}$

(3) Evaluate the sums.

   (a) $\displaystyle\sum_{j=101}^{200} j$
   (b) $\displaystyle\sum_{j=0}^{50} j(j-1)$
   (c) $\displaystyle\sum_{j=1}^{30} (2j+1)^2$
   (d) $\displaystyle\sum_{j=2}^{30} \left(6j + \frac{4j^2}{3}\right)$

(4) Evaluate the limit.

   (a) $\displaystyle\lim_{n\to\infty} \sum_{i=1}^{n} \frac{i}{n^2}$
   (b) $\displaystyle\lim_{n\to\infty} \sum_{j=1}^{n} \frac{j^3}{n^4}$
   (c) $\displaystyle\lim_{n\to\infty} \sum_{i=1}^{n} \frac{i^2-i+1}{n^3}$
   (d) $\displaystyle\lim_{n\to\infty} \sum_{i=1}^{n} \left(\frac{i^3}{n^4} - \frac{20}{n}\right)$

(5) Calculate R_8 for $f(x) = x^2 - 3x$ on the interval $[0, 4]$.

(6) Calculate L_8 for $f(x) = x^2 - 3x$ on the interval $[0, 4]$.

(7) Calculate M_8 for $f(x) = x^2 - 3x$ on the interval $[0, 4]$.

(8) Compute R_n for $f(x) = 3x^2 + 4x$ over $[0, 2]$. Leave your answer in summation (sigma) notation.

(9) Compute R_n for $f(x) = 3x^3 - x^2$ over $[1, 5]$. Leave your answer in summation (sigma) notation.

(10) Let A be the area between the graph of $f(x) = x^2 - 3x$ and the x-axis over $[0, 4]$.
   (a) Compute R_n.
   (b) Compute A as the limit $\displaystyle\lim_{n\to\infty} R_n$.