

MTH 252Z Lab

Sigma Notation

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Prompts

1. Expand the sum.

(a) $\sum_{i=1}^6 \sqrt{3i-2}$

(b) $\sum_{i=3}^8 \sqrt{3i-2}$

(c) $\sum_{i=0}^4 \left(\frac{2i+1}{i^2+2} \right) \left(\frac{2}{3} \right)$

2. Write the sum in sigma notation. Answers may vary.

(a) $1 + 3 + 5 + 7 + 9 + 11$

(b) $\left(\frac{1}{2} \right) (1 + 4 + 9 + 16 + 25 + 36 + 49 + 64)$

(c) $\frac{1}{1} + \frac{3}{4} + \frac{5}{9} + \frac{7}{16} + \frac{9}{25}$

3. Evaluate the sum.

(a) $\sum_{i=1}^{20} 3i - 2$

(b) $\sum_{i=1}^{30} 1 + 2i + 3i^2 + 4i^3$

(c) $\sum_{i=1}^{252} (i+1)^2$

4. This prompt walks through some of the computations from the next lesson.

(a) Show that $\sum_{i=1}^n \left[\left(1 + \frac{2i}{n} \right)^2 - 1 \right] \left(\frac{2}{n} \right) = \frac{20n^2 + 24n + 4}{3n^2}$.

(b) Evaluate $\lim_{n \rightarrow \infty} \frac{20n^2 + 24n + 4}{3n^2}$.

(c) Use the previous two parts together to find $\lim_{n \rightarrow \infty} \sum_{i=1}^n \left[\left(1 + \frac{2i}{n} \right)^2 - 1 \right] \left(\frac{2}{n} \right)$.