1.(1 pt) Let

$$s_k = \sum_{n=1}^{k} n(.1)^n$$

Find s_3.
$s_3 =$ ____________________

2.(1 pt) Let a_n be the n th digit after the decimal point in $6\pi + 9e$. Evaluate

$$\sum_{n=1}^{\infty} a_n(.1)^n.$$

3.(1 pt) Let $r = \frac{17}{30}$.
For both of the following answer blanks, decide whether the given sequence or series is convergent or divergent. If convergent, enter the limit (for a sequence) or the sum (for a series). If divergent, enter INF if it diverges to infinity, MINF if it diverges to minus infinity, or DIV otherwise.

A. Consider the sequence $\{nr^n\}$.
$\lim_{n\to\infty} nr^n =$ ____________________

B. Take my word for it that it can be shown that

$$\sum_{i=1}^{n} ir^i = \frac{nr^{n+2} - (n+1)r^{n+1} + r}{(1-r)^2}.$$

Now consider the series $\sum_{n=1}^{\infty} nr^n$.
$\sum_{n=1}^{\infty} nr^n =$ ____________________

4.(1 pt) Consider the series $\sum_{n=1}^{\infty} \frac{10}{n+10}$. Let s_n be the n-th partial sum; that is,

$$s_n = \sum_{i=1}^{n} \frac{10}{i+10}.$$

Find s_4 and s_8
$s_4 =$ ____________________
$s_8 =$ ____________________

5.(1 pt)
Two boys on bicycles, 44 miles apart, began racing directly toward each other. The instant they started, a fly on the handle bar of one bicycle started flying straight toward the other cyclist. As soon as it reached the other handle bar it turned and started back. The fly flew back and forth in this way, from handle bar to handle bar, until the two bicycles met.

If each bicycle had a constant speed of 15 miles an hour, and the fly flew at a constant speed of 20 miles an hour, how far did the fly fly?

6.(1 pt) Evaluate the sum:

$$\sum_{k=0}^{5} ((-1)^k(k+3)^2 + 2)$$