

Each problem is worth 5 points. Clear and complete justification is required for full credit.

1. Write the first four partial sums of the series  $\sum_{n=1}^{\infty} \frac{1}{n^2}$ .

$$\frac{1}{n^2} \quad n=1 \quad S_1 = \underline{1}$$

$$n=2 \quad S_2 = \frac{1}{4} + 1 = \underline{\frac{5}{4}} \quad \text{Great}$$

$$n=3 \quad S_3 = \frac{1}{9} + \frac{1}{4} + 1 = \underline{\frac{49}{36}}$$

$$n=4 \quad S_4 = \frac{1}{16} + \frac{1}{9} + \frac{1}{4} + 1 = \underline{\frac{205}{144}}$$

2. Find the sum of the series  $\sum_{n=0}^{\infty} 5\left(\frac{-1}{3}\right)^n$ .

$|r| < 1$  so the series converges

$$\sum_{n=0}^{\infty} 5\left(\frac{-1}{3}\right)^n = \frac{a}{r-1} = \frac{5}{1-(-1/3)} = \frac{5}{4/3} = \boxed{\frac{15}{4}}$$

Excellent