PRACTICE QUESTIONS 4
Sections 30.1-30.5

1. Find the first four partial sums for the sequence $\sum_{n=1}^{\infty} \frac{5}{n}$. Give exact values.

2. State whether each series below converges or diverges. If it converges, find the sum. Give exact values.
a) $1 - \frac{1}{3} + \frac{1}{9} - \frac{1}{27} + \ldots$
b) $5 + 25 + 125 + 625 + \ldots$
c) $4 + 1 + \frac{1}{4} + \frac{1}{16} + \ldots$
d) $1 + 2 + 3 + 4 + 5 + \ldots$

3. a) Use your formula sheet to find the first three nonzero terms of the Maclaurin series for $f(x) = \sqrt{1 + 2x}$.
b) Use part a) to approximate $\sqrt{0.88}$. Round your answer to four decimal places.

4. a) Use your formula sheet to find the first three nonzero terms of the Maclaurin series for $f(x) = 1 - 2x^3 + e^{x^3}$.
b) Use part a) to approximate $\int_0^{0.2} (1 - 2x^3 + e^{x^3})\, dx$. Round your answer to four decimal places.

5. Find the first three nonzero terms of the Taylor series of $f(x) = \sin x$ centred at $x = \frac{\pi}{6}$.

6. Find the first three nonzero terms of the Taylor series of $f(x) = \frac{1}{x+2}$ centred at $x = 2$.