

Determine which value the series converges to.

1)
$$\sum_{n=0}^{\infty} \left(\frac{2}{3}\right)^n$$

2)
$$\sum_{n=0}^{\infty} \frac{(-1)^n \left(\frac{\pi}{3}\right)^{2n}}{(2n)!}$$

Given the values of the following, construct the 4th degree Taylor Polynomial centered at $x = 0$

3. $P(0) = -6 \quad P'(0) = 5 \quad P''(0) = 9 \quad P'''(0) = -2 \quad P^{(4)}(0) = 11$

4. Write the first four terms for $f(x) = \cos(x^4)$

Find each of the following

a. $f^{(8)}(0) =$

b. $f^{(24)}(0) =$

5. If $f(x) = \dots \frac{(x-2)^{18}}{7} \dots$ find $f^{18}(2)$

Find the 3rd order Taylor Polynomial for the given center

6) $f(x) = \frac{1}{x^3}$ at $x = 1$

7) $f(x) = \cos x$ at $x = \frac{\pi}{3}$