6. [11 points]
   a. [6 points] Find the Taylor series about \( x = 0 \) for the function \( f(x) = 3 + \cos(2x^2) \). Write your answer using sigma notation and also write out the first three non-zero terms. You do not need to simplify any factorials or exponentials that appear in your answer.

   b. [5 points] The function \( f(x) \) from part a) has an antiderivative \( F(x) \) which satisfies \( F(0) = 9 \). Find the first four nonzero terms of the Taylor series about \( x = 0 \) for \( F(x) \). You do not need to simplify any factorials or exponentials that appear in your answer.

7. [5 points] Find an expression for the exact value of

\[
12 + \frac{4}{5} - \frac{4^2}{2(5)^2} + \frac{4^3}{3(5)^3} + \cdots + \frac{(-1)^{n+1}4^n}{n5^n} + \cdots
\]

which does not involve an infinite sum (i.e. no sigma notation or “…”).