IB Math HL 2 Series II Review Part 1

1a. By using the Information Booklet, write $P_5(x)$, the 5th degree Maclaurin polynomial for $h(x)=\sin 2x$.

b. Hence, use $P_5(x)$ to estimate $\sin\frac{\pi}{7}$. Round your answer to four decimal places.

2a. Write the 3rd degree Taylor polynomial, $P_3(x)$ for $f(x)=x^{3/2}$ centered at $c=9$.

b. What is the remainder when $P_3(x)$ is used to estimate $10^{3/2}$?

3. Let f be a function that has derivatives of all orders for all real numbers. Assume that $f(3)=1$, $f'(3)=4$, $f''(3)=6$, and $f'''(3)=12$.

a. Write the third order Taylor polynomial for f at $x=3$. b. Hence, approximate $f(3.2)$

c. Write the second order Taylor polynomial for f' at $x=3$. d. Hence, approximate $f'(2.7)$.

The series is the value of the Maclaurin series of a function $f(x)$ at a particular point.

a. What is the function and at what point?

b. What is the sum of the series?

4. $1-\frac{1}{4}+\frac{1}{16}-\ldots+(-1)^n\frac{1}{4^n}+\ldots$ 5. $\frac{2}{3}-\frac{4}{18}+\frac{8}{81}-\ldots+(-1)^{n-1}\frac{2^n}{n3^n}+\ldots$ 6. $\pi-\frac{\pi^3}{3!}+\frac{\pi^5}{5!}-\ldots+(-1)^n\frac{\pi^{2n+1}}{(2n+1)!}+\ldots$