King **F**ahd **U**niversity for **P**etroleum and **M**inerals
Department of Mathematics & Statistics
Term 171 Math 102 (7) Quiz#6 (11.8, 11.9, and 11.10)
Family Name: S.r#

Q1. Find the sum

i. $\sum_{n=1} \frac{(-1)^n (\ln 3)^n}{n!}$

ii. $\sum_{n=0} \frac{(-1)^n \pi^{2n}}{(2n+1)!}$

Q2. Let $P(x)$ be the first three nonzero terms in the power series of $f(x) = e^x \cos x$ centered at $a = 0$, find $P(3)$.

Q3. Find the Maclaurin series and its interval of convergent of $f(x) = \frac{x^3}{1+x^2}$.

$$f(x) = \frac{x^3}{1+x^2} \quad = x^3 \frac{1}{1-(-x^2)}$$

$$= x^3 \sum_{n=0}^{\infty} (-x^2)^n \qquad ; \left|-x^2\right| < 1$$

$$= \sum_{n=0}^{\infty} (-1)^n x^{2n+3} \qquad ; |x| < 1$$

King **F**ahd **U**niversity for **P**etroleum and **M**inerals
Department of Mathematics & Statistics

Term 171 Math 102 (25) Quiz#6 (11.8, 11.9, and 11.10)

Family Name: S.r#

Q1. Find the sum

i. $\sum_{n=1} \frac{(-1)^n \pi^{2n}}{4^n (2n)!}$

ii. $\sum_{n=0} \frac{(-1)^n \pi^{2n}}{2 \cdot n!}$

Q2. Let $P(x)$ be the Maclaurin polynomial of order 7 generated by $f(x) = \sin(x^2)$, find $P(1)$.

Q3. Find the Maclaurin series and its interval of convergent of $f(x) = \frac{x^2}{1+x^3}$.

$$f(x) = \frac{x^2}{1+x^3} \quad = x^2 \frac{1}{1-(-x^3)}$$

$$= x^2 \sum_{n=0}^{\infty} (-x^3)^n \qquad ; \left|-x^3\right| < 1$$

$$= \sum_{n=0}^{\infty} (-1)^n x^{3n+2} \qquad ; |x| < 1$$