Math 232 Calculus 2 Spring 15 Sample midterm 2

(1) Find $\int \dfrac{x}{\sqrt{4x^2+1}}dx$.

(2) Find $\int \dfrac{x^2-x+6}{(x-1)^2(x+1)}dx$.

(3) Find $\int_0^1 x^2 \ln x \; dx$.

(4) Find $\int_0^\infty \dfrac{1}{9+x^2}\; dx$.

(5) Find the degree three Taylor polynomial centered at $x = 1$ for the function $f(x) = \sqrt{x^2+2}$.

(6) Does the series $\displaystyle\sum_{n=1}^\infty \cos(\tfrac{1}{n})$ converge or diverge?

(7) Does the series $\displaystyle\sum_{n=1}^\infty \dfrac{(\ln n)^2}{n^4}$ converge or diverge?

(8) Does the series $\displaystyle\sum_{n=1}^\infty \dfrac{2^n}{n!}$ converge or diverge?

(9) Does the series $\displaystyle\sum_{n=1}^\infty \sin(\tfrac{1}{n})$ converge or diverge?

(10) Does the series $\displaystyle\sum_{n=1}^\infty \sin(\tfrac{1}{n^2})$ converge or diverge?