1910 Final Exam Review

Find the area enclosed by the curves

$$y = \sin(x)$$
$$y = \cos(x)$$

for $0 \leq x \leq \pi/2$

Does the series converge or diverge?

$$\sum_{n=2}^{\infty} \frac{1}{n(\ln n)^2}$$

$$\int_0^1 \frac{2}{(x^2+1)(x+1)}\,dx$$

Does the series converge or diverge?

$$\sum_{n=1}^{\infty} \sqrt{\frac{n^2 + n}{n^2 + 2n + 1}}$$

$$\int \frac{1}{x^2\sqrt{x^2+1}}\,dx$$

Does the series converge or diverge?

$$\sum_{n=1}^{\infty} \sin(1/n)$$

Find b such that the arc length of the curve

$$y = \frac{2}{3}x^{3/2}$$

from $x = 0$ to $x = b$ has length $14/3$

Find the interval of convergence

$$f(x) = \sum_{n=1}^{\infty} \frac{3^n}{n}(x-1)^n$$

Find the interval of convergence of $f'(x)$

$$f(x) = \sum_{n=1}^{\infty} \frac{3^n}{n}(x-1)^n$$

Does the sequence converge or diverge?

$$a_n = (-1)^n \frac{n}{n^2 + 1}$$

Does the sequence converge or diverge?

$$a_n = \frac{n^2 + 2e^n}{n^3 + e^n}$$

$$\int \cos(\sqrt{x})\, dx$$

Does the series converge or diverge?

$$\sum_{n=1}^{\infty} \frac{2^n}{(n!)^2}$$

Find the Maclaurin series

$$f(x) = \int_0^x \frac{1}{1+t^4}\,dt$$