Groupwork 04/22: MATH 112 Prof. Maxwell Auerbach

Show all work. No credit will be given for answers without sufficient work. No calculators are allowed.

1 In Class Problems: Integration Review

1.1 Evaluate the following integral:

$$\int \cos(2x)e^x \, dx$$

1.2 Peredur finds that a pendulum has an a speed of $p(t) = \tan^2(t)\sec^6(t)$ meters per second. Find the distance covered by the pendulum between the time $t = 0$ seconds and $t = \pi/4$ seconds.

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2 In Class Problems: Series Review

2.1 Use any test to show whether the following series converge or diverge, making sure to explicitly cite every test you use.

$$\sum_{n=1}^{\infty} \frac{\cos(\pi n)\ln(n)}{n^3}$$

2.2 Use any test to show whether the following series converge or diverge, making sure to explicitly cite every test you use.

$$\frac{7}{3} + \frac{14}{6} + \frac{21}{12} + \frac{28}{24} + \frac{35}{48} + \cdots$$

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3 In Class Problems: Taylor Series Review

3.1 Find the Taylor series for $f(x) = x\sin(x)$ at $a = 0$ using the definition of Taylor series.

3.2 Find any Taylor series and its radius of convergence for the following functions, citing every known series you use. Your answer should only have one x term.

$$\cos(x) - \sin(x)/x$$