Math 2260: Midterm 2

Spring 2017

Name: _____

- Write your solutions in the space provided. Continue on the back for more space.
- Show your work unless asked otherwise.
- Partial credit will be given for incomplete work.
- The exam contains 5 problems.

Question:	1	2	3	4	5	Total
Points:	10	10	10	10	10	50
Score:						

1. Evaluate the indefinite integrals

   (a) (5 points) $\int x^3 \ln x \, dx.$

   (b) (5 points) $\int \frac{2x}{x^2+4} \, dx.$

2. (10 points) Evaluate the definite integral

$$\int_0^1 \frac{x^2}{\sqrt{4-x^2}} \, dx.$$

3. (10 points) Evaluate the indefinite integral

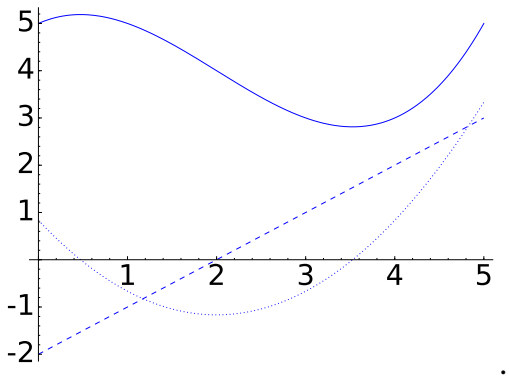
$$\int \frac{x+1}{x^2(x-1)} \, dx.$$

4. Do the following integrals converge or diverge? Justify your answer.

   (a) (5 points) $\int_0^\infty \frac{x+1}{\sqrt{x^3+1}} \, dx$

   (b) (5 points) $\int_0^\infty \frac{1+\cos x}{x^2} \, dx$

5. The graph below shows a function $f(x)$ (solid), its derivative $f'(x)$ (dotted), and $f''(x)$ (dashed). The table on the right lists some values of $f(x)$.



x	$f(x)$
0	5
1	5
2	5
3	4
4	5
5	5

.

   (a) (5 points) Compute $\int_0^4 f(x) \, dx$ with the trapezoid rule using 4 sub-intervals.

   (b) (5 points) How many sub-intervals will you need to make to compute the integral using the trapezoid rule with error at most 0.001? Justify your answer.