

HOMEWORK 11 - MATH 160

DUE DATE: Tuesday, December 1

INSTRUCTOR: George Voutsadakis

Read each problem **very carefully** before starting to solve it. Two out of the ten problems will be chosen at random and graded for a total of 20 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

- Find the area of the region under the graph of $f(x)$ on the interval $[a, b]$:
 - $f(x) = 4x - x^2; [0, 4]$
 - $f(x) = \frac{1}{\sqrt{x}}; [1, 9]$
 - $f(x) = e^x - x; [1, 2]$
- Evaluate the definite integrals:
 - $\int_0^2 8x^3 dx$
 - $\int_1^4 2x^{-3/2} dx$
 - $\int_0^1 \sqrt{2x}(\sqrt{x} + \sqrt{2}) dx$
- Evaluate the definite integrals:
 - $\int_1^3 x\sqrt{3x^2 - 2} dx$
 - $\int_0^2 \frac{x}{\sqrt{x^2 + 5}} dx$
 - $\int_1^4 x\sqrt{x + 1} dx$
- Evaluate the definite integrals:
 - $\int_0^4 \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$
 - $\int_0^1 \frac{e^x}{1+e^x} dx$
 - $\int_1^2 \frac{\ln x}{x} dx$
- Find the area of the region under the graph of $f(x)$ on the interval $[a, b]$:
 - $f(x) = 2 + \sqrt{x + 1}; [0, 3]$
 - $f(x) = \frac{\ln x}{4x}; [1, 2]$
- Find the average value of $f(x)$ over the indicated interval:
 - $f(x) = 4 - x^2; [-2, 3]$
 - $f(x) = xe^{x^2}; [0, 2]$
- Graph on the same system of axes the functions $f(x) = x - 2$ and $g(x) = \sqrt{x}$.
 - Find the point where the two graphs intersect.
 - Find the area of the region enclosed by the two graphs and the y -axis.
- Graph on the same system the functions $f(x) = x^3$, $g(x) = x + 6$ and $h(x) = -\frac{1}{2}x$.
 - Find the points where these graphs intersect.
 - Find the area of the region enclosed by these three graphs.
- Sketch the graph and find the area of the region completely enclosed by the graphs of the functions $f(x) = -x^2 + 4x$ and $g(x) = 2x - 3$.
- No tenth problem this week! Happy Thanksgiving!**