

MATH 152, Fall 2019

Worksheet 1

1. Grading scheme: 0 for absence, 2 for mere presence (but nothing more), 3, 4, and 5 for further participation (judgement left to the UTF).
2. The UTF will maintain a log of each student's scores.
3. We will offer any help/guidance we can, but we will not impose ourselves or our ideas to the UTFs.
4. The teachers will be asked to get in touch with their UTFs and instruct them on how they want the grades delivered

1. Using u-sub, find the following integral

$$\int \sqrt{4 + \sqrt{x}} dx$$

2. Compute the area of the region enclosed by the graphs of the given equations: $x = y^3$ and $x = y^2 + 2y$. Sketch the region.

3. Using u-sub, find the following integral

$$\int_1^9 \frac{dx}{(x+1)\sqrt{x}+2x}$$

4. Use the method of cylinders to determine the volume of the solid obtained by rotating the region bounded by $y = \frac{e^{x/2}}{x+2}$, $y = 5 - \frac{1}{4}x$, $x = -1$, and $x = 6$ about the line $x = -2$
5. A tank in the shape of an inverted cone has a height of 15 meters and a base radius of 4 meters and is filled with water to a depth of 12 meters. Determine the amount of work needed to pump all of the water to the top of the tank. Assume that the density of the water is 1000 kg/m^3 .
6. Use the method of cylinders to determine the volume of the solid obtained by rotating the region bounded by $y = \frac{e^{x/2}}{x+2}$, $y = 5 - \frac{1}{4}x$, $x = -1$, and $x = 6$ about the line $x = -2$
7. A rope of length l feet that weighs ρ lbs/ft is lying on the ground. What is the work done in lifting the rope so that it hangs from a beam $2l$ feet high?