

Due October 20

Study Group Members

Name**Only write on one side of each page.**

I encourage you to work with others on this quiz. As with all writing you should work out the details in a draft before writing a final solution. Be sure to follow the writing guidelines listed in the course information sheet unless explicitly directed to do otherwise in the problem statement. You do not need to include every algebra or arithmetic step but you should include enough detail to allow a member of your target audience to reconstruct any missing steps. Be sure to include in-line citations, with page numbers if appropriate, every time you use the results of discussion, a text, notes, or technology. If you include graphs, they should be done carefully on graph paper. Finally, there is to be no collaboration in the writing of your solution even if you worked out the details with other people.

“To those who do not know mathematics it is difficult to get across a real feeling as to the beauty, the deepest beauty of nature. If you want to learn about nature, to appreciate nature, it is necessary to understand the language that she speaks in”. -Richard Feynman (1918-1988)

ProblemsDo **one** (1) of the following problems

1. A paraboloid is generated by revolving the curve $x = \sqrt{y}$ about the y -axis. A **zone** of the paraboloid is that portion of the surface between two parallel planes which are perpendicular to the y -axis. Determine a formula for the area of a zone of altitude h which lies between the planes $y = a$ and $y = a + h$, $a \geq 0$.
2. Water is leaking from a 15-pound bucket at a constant rate of $0.1\text{ft}^3/\text{min}$. If the bucket originally contained 3 cubic feet of water at 62.5 lb/ft^3 , find the work done in raising the bucket 100 feet at the constant rate of 10 ft/min .