

Homework 6

due Oct 21, 2015

In addition to

6.8. 1, 3, 9, 17, 19, 22, 24, 30, 34, 38, 42, 46, 49, 50, 54, 58, 62, 65, 66, 71, 76, 84 (sketch by hand), 92

7.8. 1, 5, 7, 13, 16, 20, 24, 27, 31, 32, 36, 40, 44 (same function as #84 with $n = 1$), 49, 52, 54, 55, 75, 78

Related Rates exercises 19-32. For 20b, sketch approximately

11.1 5, 11, 15, 17, 21, 24, 25, 29, 31, 32, 33, 40, 41, 45, 49, 67, 73, 74, 76, 90

complete the following problem.

1. Gabriel's Horn. Consider Gabriel's Horn: the surface formed by rotating the curve $f(x) = 1/x$ about the x -axis for $x \geq 1$. Can the horn hold enough paint to paint the horn's surface?

The volume V and surface area S of a solid of revolution generated by rotating the curve $g(x)$, $a \leq x \leq b$, about the x -axis, are given by

$$V = \pi \int_a^b g(x)^2 dx \quad \text{and} \quad S = 2\pi \int_a^b g(x) \sqrt{1 + [g'(x)]^2} dx$$

Challenge problem Find

$$\lim_{x \rightarrow \infty} \left(\sqrt[3]{x^3 + x^2} - \sqrt[3]{x^3 - x^2} \right).$$

TO BE GRADED

6.8. 1, 3, 30, 38, 42, 46, 50, 54, 58, 62

7.8. 1, 5, 24, 31, 40, 52, 54, 55, 75, 78

11.1. 11, 17, 21, 25, 31, 33, 45, 49, 67

Challenge problem