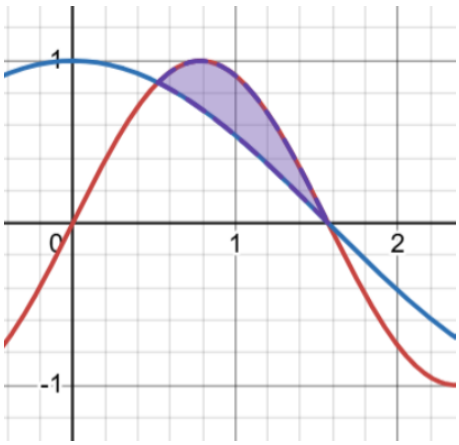
Extra Area and Volume Problems

Directions: Do these problems.

1. Find the area in the first and second quadrants between $f(x) = 4 - x^2$ and the x-axis.

2. Find the area of the shaded region bounded by $f(x) = \sin 2x$ and $g(x) = \cos x$ as shown in the figure.



3. The shaded region bounded by $f(x) = \sin 2x$ and $g(x) = \cos x$, as shown in the figure above, is revolved around the x-axis. Find the volume of the resulting solid.

4. Find the area of the singular region bounded in both the first and second quadrant between the function $f(x) = \sin x + \cos x$ and the x-axis.

5. The singular region bounded in both the first and second quadrant between the x-axis and the function $f(x) = \sin x + \cos x$ is revolved around the x-axis. Find the volume of the resulting solid.

6. The region enclosed between the functions $f(x) = 9 - x^2$ and $g(x) = 2x + 1$ is revolved around the line $x = 5$. Set up an integral to find the volume of the solid. Use a calculator to evaluate the integral.

7. The region enclosed between the functions $f(x) = 9 - x^2$ and $g(x) = 2x + 1$ is revolved around the line $x = -4$. Set up an integral to find the volume of the solid. Use a calculator to evaluate the integral.

8. The region enclosed between the functions $f(x) = 9 - x^2$ and $g(x) = 2x + 1$ is revolved around the line $y = 10$. Set up an integral to find the volume of the solid. Use a calculator to evaluate the integral.

9. The region enclosed between the functions $f(x) = 9 - x^2$ and $g(x) = 2x + 1$ is revolved around the line $y = -9$. Set up an integral to find the volume of the solid. Use a calculator to evaluate the integral.

10. Find the area of the region in the first quadrant enclosed between $f(x) = \frac{1}{x-1}$, $g(x) = \frac{1}{2-x}$, $x = 0$, $x = 3$, and the x-axis.

11. The region in the first quadrant enclosed between $f(x) = \frac{1}{x-1}$, $g(x) = \frac{1}{2-x}$, $x = 0$, $x = 3$, and the x-axis is revolved around the x-axis. Find the volume of the resulting solid.

12. The region in the first quadrant between $f(x) = \frac{1}{x-1}$, $g(x) = \frac{1}{2-x}$, $x = 0$, $x = 3$, and the x-axis is revolved around the y-axis. Find the volume of the resulting solid.

13. Find the area of the region enclosed between $f(x) = 1 + \tan x$, $x = \frac{\pi}{4}$, the x-axis, and the y-axis.

14. The area of the region enclosed between $f(x) = 1 + \tan x$, $x = \frac{\pi}{4}$, the x-axis, and the y-axis is revolved around the x-axis. Find the volume of the resulting solid.

15. The area of the region enclosed between $f(x) = 1 + \tan x$, $x = \frac{\pi}{4}$, the x-axis, and the y-axis is revolved around the y-axis. Write an integral to represent the volume of the resulting solid. Use a calculator to find the volume.

16. The area of the region enclosed between $f(x) = 1 + \tan x$, $x = \frac{\pi}{4}$, and the x-axis is revolved around the line $x = \frac{\pi}{4}$. Write an integral to represent the volume of the resulting solid. Use a calculator to find the volume.

17. The area of the region enclosed between $f(x) = 1 + \tan x$, $x = \frac{\pi}{4}$, and the x-axis is revolved around the line $x = 4$. Write an integral to represent the volume of the resulting solid. Use a calculator to find the volume.

18. The area of the region enclosed between $f(x) = 1 + \tan x$, $x = \frac{\pi}{4}$, and the x-axis is revolved around the line $x = -5$. Write an integral to represent the volume of the resulting solid. Use a calculator to find the volume.

19. The region between $f(x) = \sqrt{x}$ and $g(x) = x$ is revolved around the x-axis. Set up an integral using discs/washers to find the volume of the resulting solid.

20. The region between $f(x) = \sqrt{x}$ and $g(x) = x$ is revolved around the x-axis. Set up an integral using shells to find the volume of the resulting solid.

21. The region between $f(x) = \sqrt{x}$ and $g(x) = x$ is revolved around the y-axis. Set up an integral using discs/washers to find the volume of the resulting solid.

22. The region between $f(x) = \sqrt{x}$ and $g(x) = x$ is revolved around the y-axis. Set up an integral using shells to find the volume of the resulting solid.

23. The region between $f(x) = \sqrt{x}$ and $g(x) = x$ is revolved around the line $x = 1$. Set up an integral using discs/washers to find the volume of the resulting solid.

24. The region between $f(x) = \sqrt{x}$ and $g(x) = x$ is revolved around the line $x = 1$. Set up an integral using shells to find the volume of the resulting solid.

25. The region between $f(x) = \sqrt{x}$ and $g(x) = x$ is revolved around the line $y = 1$. Set up an integral using discs/washers to find the volume of the resulting solid.

26. The region between $f(x) = \sqrt{x}$ and $g(x) = x$ is revolved around the line $y = 1$. Set up an integral using shells to find the volume of the resulting solid.

27. The region between $f(x) = \sqrt{x}$ and $g(x) = x$ is revolved around the line $x = -1$. Set up an integral using discs/washers to find the volume of the resulting solid.

28. The region between $f(x) = \sqrt{x}$ and $g(x) = x$ is revolved around the line $x = -1$. Set up an integral using shells to find the volume of the resulting solid.

29. The region between $f(x) = \sqrt{x}$ and $g(x) = x$ is revolved around the line $y = -2$. Set up an integral using discs/washers to find the volume of the resulting solid.

30. The region between $f(x) = \sqrt{x}$ and $g(x) = x$ is revolved around the line $y = -2$. Set up an integral using shells to find the volume of the resulting solid.