

MAT 126 Fall 2020, Quiz 5

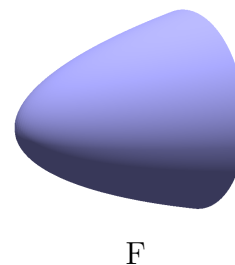
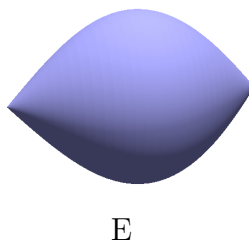
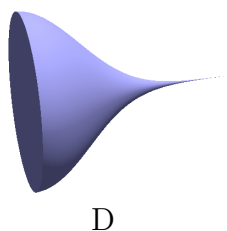
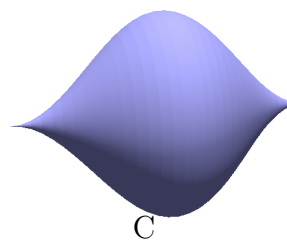
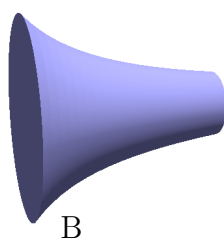
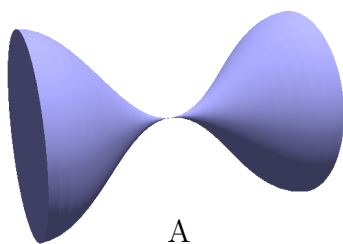
Name	ID	Section
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**THIS QUIZ IS WORTH 10 POINTS.
NO BOOKS, NOTES OR CALCULATORS ARE ALLOWED.**

Write the correct answer in the box.

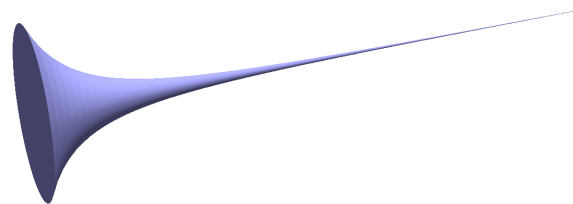
Match each formula with the picture of its graph rotated around the x -axis.

- (1) $\cos^2(x)$ on $[0, \pi]$ (2) $1/x$ on $[1, \pi]$ (3) e^{-x^2} on $[1, \pi]$



- (4) The region below is $\{0 \leq y \leq 1/x : 1 \leq x < \infty\}$, rotated around the x -axis. What is the integral formula for the volume using the disk method?

- | | |
|-----------------------------------|------------------------------------|
| (a) $\pi \int_1^\infty x^{-1} dx$ | (f) $2\pi \int_1^\infty x^{-2} dx$ |
| (b) $\pi \int_1^\infty x^{-2} dx$ | (g) $2\pi \int_1^\infty x^{-4} dx$ |
| (c) $\pi \int_1^\infty x^{-3} dx$ | (h) $2\pi \int_1^\infty x^{-6} dx$ |
| (d) $\pi \int_1^\infty x^{-4} dx$ | (i) $2\pi \int_1^\infty x^{-8} dx$ |
| (e) $\pi \int_1^\infty x^{-6} dx$ | (j) none of the above |

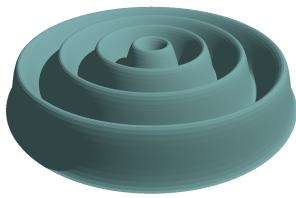


- (5) Compute the volume of the region in Problem 4.

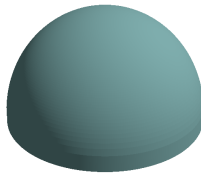
- | | | | | |
|-------------|-------------|-------------|--------------|-----------------------|
| (a) $\pi/8$ | (c) $\pi/6$ | (e) $\pi/4$ | (g) $\pi/2$ | (i) π |
| (b) $\pi/7$ | (d) $\pi/5$ | (f) $\pi/3$ | (h) $2\pi/3$ | (j) none of the above |

Match each formula with the picture of its graph rotated around the y -axis.

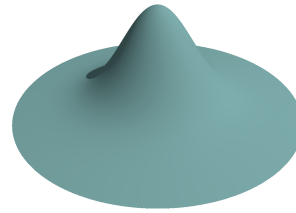
- (6) $\exp(-x^2)$ on $[0, 2]$ (7) $\sin^2(x)$ on $[0, \pi]$ (8) $\sqrt{1-x^2}$ on $[0, 1]$



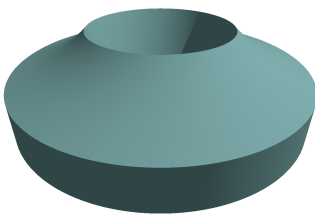
A



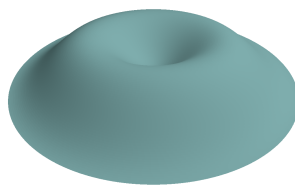
B



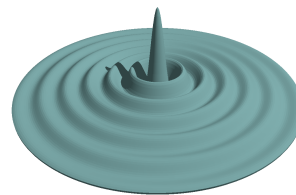
C



D



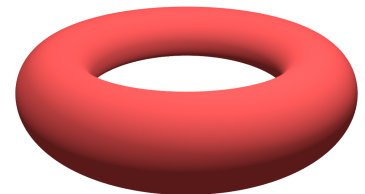
E



F

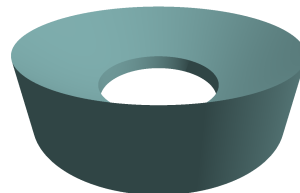
- (9) The region below is the disk of radius 1 centered at $x = 4, y = 0$ rotated around the y -axis. Using the method of cylindrical shells, the volume is given by which integral?

- (a) $\pi \int_{-1}^1 x\sqrt{1-x^2}dx$ (f) $2\pi \int_3^4 \sqrt{4-x^2}dx$
 (b) $\pi \int_{-1}^1 \sqrt{1-x^2}dx$ (g) $\pi \int_3^5 x\sqrt{1-x^2}dx$
 (c) $2\pi \int_4^5 x\sqrt{1-x^2}dx$ (h) $2\pi \int_{-5}^5 (x-4)\sqrt{1-x^2}dx$
 (d) $\int_{-1}^1 (x-4)\sqrt{1-x^2}dx$ (i) $\int_{-1}^1 \sqrt{1-(x-4)^2}dx$
 (e) $4\pi \int_3^5 x\sqrt{1-(x-4)^2}dx$ (j) none of the above



- (10) The region below is the graph of $x^2, 1 \leq x \leq 2$ rotated around the y -axis. Using the method of cylindrical shells, compute the volume.

- (a) π (f) $62\pi/5$
 (b) 2π (g) $31\pi/4$
 (c) $2\pi/5$ (h) $14\pi/3$
 (d) $7\pi/5$ (i) $7\pi/3$
 (e) $15\pi/2$ (j) none of the above



Answers: 1A, 2B, 3D, 4B, 5I, 6C, 7E, 8B, 9E, 10E