

Calculus 6.3 Part II Cylindrical Shell Method

Lesson 311 | Calculus AB | Cylindrical shells

<https://www.youtube.com/watch?v=NhbHfxas7KA>

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01

Use cylindrical shells to rotate the region under $y=3x$, $0 \leq x \leq 12$, about the y-axis.

02

Use cylindrical shells to rotate the region under $y=14x$, $0 \leq x \leq 4$, about the y-axis.

03

Use cylindrical shells to rotate the region under $y=4x$, $0 \leq x \leq 11$, about the y-axis.

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04

Use cylindrical shells to rotate the region under $y=10x$, $0 \leq x \leq 5$, about the y-axis.

05

Use cylindrical shells to rotate the region under $y=12x$, $0 \leq x \leq 10$, about the y-axis.

06

Use cylindrical shells to rotate the region under $y=13x$, $0 \leq x \leq 9$, about the y-axis.

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01

Use cylindrical shells to rotate the region under $y=3x$, $0 \leq x \leq 12$, about the y -axis.

Shell radius x , height $3x$. $V=2\pi \int [0,12] x(3x) dx = 2\pi [3x^3/3]_0^{12} = 3456\pi$.

02

Use cylindrical shells to rotate the region under $y=14x$, $0 \leq x \leq 4$, about the y -axis.

Shell radius x , height $14x$. $V=2\pi \int [0,4] x(14x) dx = 2\pi [14x^3/3]_0^4 = 1792/3\pi$.

03

Use cylindrical shells to rotate the region under $y=4x$, $0 \leq x \leq 11$, about the y -axis.

Shell radius x , height $4x$. $V=2\pi \int [0,11] x(4x) dx = 2\pi [4x^3/3]_0^{11} = 10648/3\pi$.

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04

Use cylindrical shells to rotate the region under $y=10x$, $0 \leq x \leq 5$, about the y -axis.

Shell radius x , height $10x$. $V=2\pi \int_{0,5} x(10x)dx=2\pi [10x^3/3]_0^5=2500/3\pi$.

05

Use cylindrical shells to rotate the region under $y=12x$, $0 \leq x \leq 10$, about the y -axis.

Shell radius x , height $12x$. $V=2\pi \int_{0,10} x(12x)dx=2\pi [12x^3/3]_0^{10}=8000\pi$.

06

Use cylindrical shells to rotate the region under $y=13x$, $0 \leq x \leq 9$, about the y -axis.

Shell radius x , height $13x$. $V=2\pi \int_{0,9} x(13x)dx=2\pi [13x^3/3]_0^9=6318\pi$.