

1. (1 point)

The volume of the solid obtained by rotating the region enclosed by

$$y = x^3, y = 36x, x \geq 0$$

about the line $y = 0$ can be computed using vertical slices via an integral

$$V = \int_a^b \text{_____} \boxed{?}$$

with limits of integration $a = \text{_____}$ and $b = \text{_____}$.

The volume is $V = \text{_____}$ cubic units.

Note: You can earn full credit if the last question is correct and all other questions are either blank or correct.

Correct Answers:

- $\pi * ((36*x)**2) - \pi * ((x**3)**2)$
- DX
- 0
- 6
- 167513.310681012

2. (1 point)

Using vertical slices, find the volume of the solid obtained by rotating the region bounded by the curves $y = \sqrt{x-1}$, $y = 0$, $x = 2$, and $x = 6$ about the x -axis.

Volume = _____

Correct Answers:

- $\pi * ((6)^2/2-6)$

3. (1 point)

Using horizontal slices, find the volume of the solid obtained by rotating the region bounded by

$$x = 8y^2, y = 1, x = 0$$

about the y -axis.

Answer: _____

Correct Answers:

- $8*8*\pi/5$

4. (1 point)

Find the volume of the solid obtained by rotating the region bounded by

$$y = 0, y = \cos(1x), x = \pi/2, x = 0$$

about the line $y = -8$

Answer: _____

Hint

Correct Answers:

- $\pi*\pi/(4*1) + 2*8*\pi/1$

5. (1 point) Find the volume of the solid obtained by rotating the region bounded by $y = x$ and $y = \sqrt{x}$ about the line $x = 3$.

Volume = _____

Correct Answers:

- $\pi*(3/3-2/15)$

6. (1 point)

A spring has a natural length of 20 cm. If a 25-N force is required to keep it stretched to a length of 30 cm, how much work (in J) is required to stretch it from 20 cm to 25 cm?

Work done = _____ J

Correct Answers:

- 0.3125

7. (1 point)

If 6 J of work are needed to stretch a spring from 10 cm to 12 cm and another 10 J are needed to stretch it from 12 cm to 14 cm - what is the natural length (in cm) of the spring?

Natural length of the spring = _____ cm

Correct Answers:

- 8

8. (1 point)

A particle is moved along the x -axis by a force that measures $10/(1+x)^2$ N at a point x metres from the origin. Find the work (in joules) done in moving the particle from the origin to a distance of 9 metres.

Work done = _____ joules

Correct Answers:

- 9

9. (1 point)

A cable that weighs 2 kg/m is used to lift 800 kg of coal up a mineshaft 500 m deep. Find the work done (in joules). Use the value 9.8 m/s^2 for the acceleration due to gravity.

Work done = _____ joules

Correct Answers:

- $650000*9.8$