**Score:** 1 of 1 pt | 1 of 31 | **Test Score:** 86.9%, 26.94 of 31

6.1.1

Question Help

A solid lies between planes perpendicular to the x-axis at $x = 0$ and $x = 18$. The cross-sections perpendicular to the axis on the interval $0 \le x \le 18$ are squares with diagonals that run from the parabola $y = -2\sqrt{x}$ to the parabola $y = 2\sqrt{x}$. Find the volume of the solid.

The volume of the solid is 1296 cubic units.
(Type an exact answer, using $\pi$ as needed.)

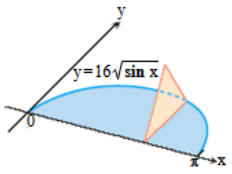
**Score:** 1 of 1 pt | 2 of 31 | **Test Score:** 86.9%, 26.94 of 31 pts

6.1.5

Question Help

Find the volume of the following solids.

The base of a solid is the region between the curve $y = 16\sqrt{\sin x}$ and the interval $[0,\pi]$ on the x-axis. The cross-sections perpendicular to the x-axis are
**a.** equilateral triangles with bases running from the x-axis to the curve as shown in the figure.
**b.** squares with bases running from the x-axis to the curve.




**a.** $V =$ $128\sqrt{3}$ (Type an exact answer, using radicals as needed.)

**b.** $V =$ 512 (Type an exact answer, using radicals as needed.)

**Score:** 1 of 1 pt | 3 of 31 | **Test Score:** 86.9%, 26.94 of 31 pts

6.1.9

Question Help

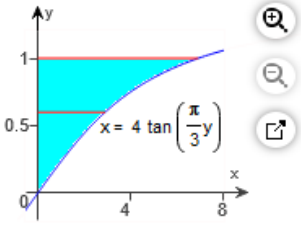
A solid lies between planes perpendicular to the y-axis at $y = 0$ and $y = 2$. The cross-sections perpendicular to the y-axis are circular disks with diameters running from the y-axis to the parabola $x = \sqrt{17}y^2$. Find the volume of the solid.

The volume of the solid is $\frac{136\pi}{5}$ cubic units.
(Type an exact answer, using $\pi$ as needed.)

**Score:** 1 of 1 pt | 4 of 31 | **Test Score:** 86.

6.1.17

Find the volume of the solid generated by revolving the shaded region about the y-axis.




The volume of the solid generated by revolving the shaded region about the y-axis is $16\left(3\sqrt{3} - \pi\right)$.
(Type an exact answer, using $\pi$ as needed.)

**Score:** 1 of 1 pt | 5 of 31 | **Test Score:** 86.9%, 26

6.1.19

Find the volume of the solid generated by revolving the region bounded by $y = 3x^2$, $y = 0$, and $x = 3$ about the x-axis.

The volume of the solid generated by revolving the region bounded by $y = 3x^2$, $y = 0$, and $x = 3$ about the x-axis is $\frac{2187\pi}{5}$ cubic units.

(Type an exact answer, using $\pi$ as needed.)

**Score:** 1 of 1 pt | 5 of 31 | **Test Score:** 86.9%, 26.94

6.1.19

Find the volume of the solid generated by revolving the region bounded by $y = 3x^2$, $y = 0$, and $x = 3$ about the x-axis.

The volume of the solid generated by revolving the region bounded by $y = 3x^2$, $y = 0$, and $x = 3$ about the x-axis is $\frac{2187\pi}{5}$ cubic units.

(Type an exact answer, using $\pi$ as needed.)

**Score:** 0 of 1 pt | 6 of 31 | **Test S**

6.1.21

Find the volume of the solid generated by revolving the region bounded by the given line and curve about the x-axis.

$y = \sqrt{4 - x^2}$, $y = 0$

The volume of the solid is $\frac{32\pi}{3}$. (Type an exact answer, using $\pi$ as needed.)

You answered: $\frac{92\pi}{3}$

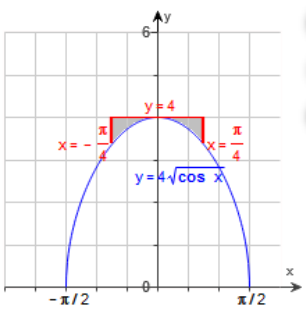
Get answer feedback

**Score:** 1 of 1 pt | 7 of 31 | **Test Score:** 86.9%, 26.94 of 31 pts

6.1.33

Question Help

Use the washer method to find the volume of the solid generated by revolving the shaded region about the x-axis.




The volume of the solid generated by revolving the shaded region about the x-axis is 7.87 cubic units.

(Round to the nearest hundredth as needed.)

**Score:** 1 of 1 pt | 8 of 31 | **Test Score**

## 6.1.35

Find the volume of the solid generated by revolving the region bounded by the given curve and lines about the x-axis.

$y = 2x,\ y = 4,\ x = 0$

$V = \frac{64\pi}{3}$

(Type an exact answer, using $\pi$ as needed.)

**Score:** 1 of 1 pt | 9 of 31 | **Test Score:** 86.9%, 26.94 of 31

## 6.1.37

Question Help

Find the volume of the solid generated by revolving the region bounded by the graphs of $y = 2x^2 + 1$ and $y = 2x + 7$ about the x-axis.

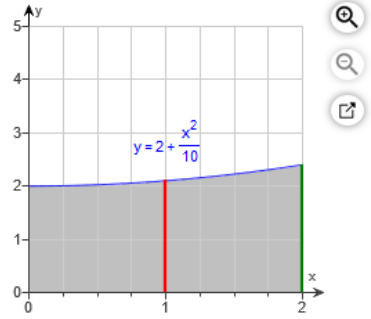
The volume of the solid generated by revolving the region bounded by the graphs of $y = 2x^2 + 1$ and $y = 2x + 7$ about the x-axis is 530.11 cubic units.
(Round to the nearest hundredth.)

**Score:** 1 of 1 pt | 10 of 31 | **Test Score:** 86.9%, 26.94 of 31 pts

## 6.2.1

Question Help

Use the shell method to find the volume generated by revolving the shaded region about the y-axis.




The volume generated by revolving the shaded region about the y-axis is $\frac{44\pi}{5}$ cubic units.

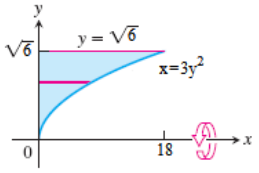
(Type an exact answer, using $\pi$ as needed, or round to the nearest tenth.)

**Score:** 1 of 1 pt | 11 of 31 | **Test Score:** 86.9%, 26.94 of 31 pts

## 6.2.3

Question Help

Use the shell method to find the volume of the solid generated by revolving the shaded region about the x-axis.




The volume is $54\pi$.

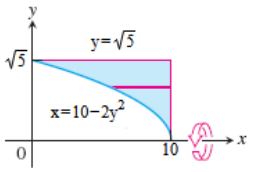
(Type an exact answer, using $\pi$ as needed.)

**Score:** 1 of 1 pt | 12 of 31 | **Test Score:** 86.9%, 26.94 of 31 pts

6.2.4

Question Help

Use the shell method to find the volume of the solid generated by revolving the shaded region about the x-axis.



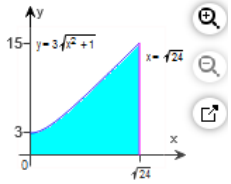

The volume is $25\pi$.
(Type an exact answer in terms of $\pi$.)

**Score:** 1 of 1 pt | 13 of 31 | **Test Score:** 86.9%, 26.94 of 31 p

6.2.5

Question Help

Use the shell method to find the volume of the solid generated by revolving the shaded region about the y-axis.




The volume is $248\pi$.
(Type an exact answer, using $\pi$ as needed.)

**Score:** 1 of 1 pt | 14 of 31 | **Test Score:** 86.9%, 26

6.2.9

Questio

Use the shell method to find the volume of the solid generated by revolving the regions bounded by the curves and lines about the y-axis.

$y = x^2$, $y = 11 - 10x$, $x = 0$, for $x \geq 0$

The volume is $\frac{23\pi}{6}$.
(Type an exact answer in terms of $\pi$.)

**Score:** 1 of 1 pt | 15 of 31 | **Test Score:** 86

6.5.1

It takes 1700 J of work to stretch a spring from its natural length of 1 m to a length of 2 m. Find the force constant of the spring.

The spring's force constant is 3400 N / m.
(Type an integer or a simplified fraction.)

**Score:** 1 of 1 pt | 16 of 31 | **Test Score:** 86.9%, 26.94 of 31 pts

6.5.3

Question Help

A force of 9 N will stretch a rubber band 6 cm (0.06 m). Assuming that Hooke's law applies, how far will an 18-N force stretch the rubber band? How much work does it take to stretch the rubber band this far?

How far will an 18-N force stretch the rubber band?

.12 m
(Simplify your answer.)

How much work does it take to stretch the rubber band this far?

1.08 J
(Simplify your answer.)

**Score:** 1 of 1 pt | 17 of 31 | **Test Score:** 86

6.5.7

A mountain climber is about to haul up a 70-m length of hanging rope. How much work will it take if the rope weighs 0.7 N/m?

The amount of work required is 1715 J.
(Type an integer or a decimal.)

**Score:** 1 of 1 pt | 18 of 31 | **Test Score:** 86.9%, 26.94 of 31 pt

6.5.9

Question Help

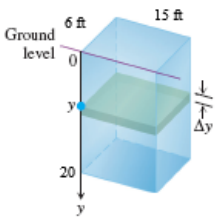
An electric elevator with a motor at the top has a multistrand cable weighing 3 lb/ft. When the car is at the first floor, 160 ft of cable are paid out, and effectively 0 ft are out when the car is at the top floor. How much work does the motor do just lifting the cable when it takes the car from the first floor to the top?

The amount of work required is 38400 ft-lb.
(Simplify your answer.)

**Score:** 0.94 of 1 pt | 19 of 31 | **Test Score:** 86.9%, 26.94 of 31 pts

6.5.13 | Question Help

The rectangular tank shown here, with its top at ground level, is used to catch runoff water. Assume that the water weighs 62.2 lb / ft$^3$.




**a.** How much work does it take to empty the tank by pumping the water back to ground level once the tank is full?

**b.** If the water is pumped to ground level with a (5 / 11)-horsepower (hp) motor (work output 250 ft-lb/sec), how long will it take to empty the tank (to the nearest minute)?

**c.** Show that the pump in part (b) will lower the water level 10 ft (halfway) during the first 19 minutes of pumping.

**d.** What are the answers to parts (a) and (b) in a location where water weighs 62.08 lb / ft$^3$? 62.32 lb / ft$^3$?

**a.** Set up an integral to find the work done. Note that the positive y direction measures distance below the ground in this problem.

$$W = \int_{0}^{20} 5598y \, dy$$

How much work does it take to empty the tank?

1119600 ft-lb

**b.** How long will it take to empty the tank?

75 minutes (Round to the nearest minute as needed.)

**c.** How much work does it take to lower the water level halfway?

279900 ft-lb

It will take the pump 19 minutes to do this work, so the pump will lower the water level halfway during the first 19 minutes of pumping. (Round to the nearest minute as needed.)

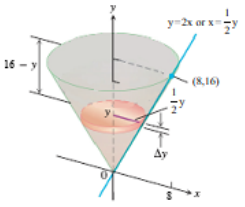
**d.** In a location where water weighs 62.08 lb / ft$^3$, it will take 1117440 ft-lb of work to empty the tank, and it will take 74 minutes to empty the tank.

In a location where water weighs 62.32 lb / ft$^3$, it will take 1121760 ft-lb of work to empty the tank, and it will take 75 minutes to empty the tank.

**Score:** 0 of 1 pt | 20 of 31 | **Test Score:** 86.9%, 26.94 of 31 pts

6.5.15 | Question Help

The conical tank shown here is filled with olive oil weighing 55 lb/ft$^3$. How much work does it take to pump all of the oil to the rim of the tank?




W = 235,913 ft-lb (Round to the nearest whole number as needed.)

You answered: 235912

Get answer feedback

**Score:** 1 of 1 pt

21 of 31

## 6.5.25

Find the work required to pitch a 6.4 oz softball at 100 ft/sec.

The work required to pitch a 6.4 oz softball at 100 ft/sec is 62.5 ft-lb.
(Do not round until the final answer. Then round to the nearest tenth as needed.)

**Score:** 0 of 1 pt

22 of 31

**Test Sc**

## 6.5.26

Find the work required to project a 9 oz object initially at rest to 150 ft/sec.

The work required to project a 9 oz object initially at rest to 150 ft/sec is 197.8 ft-lb.
(Do not round until the final answer. Then round to the nearest tenth as ne

You answered: 200.3
Correct answers: 197.8
196.5
196.7

Get answer feedback

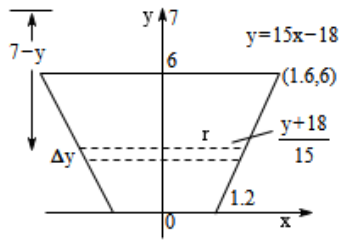
**Score:** 1 of 1 pt

23 of 31

**Test Scor**

## 6.5.29

The truncated conical container shown below is full of a beverage that weighs 0.35 oz / $in^3$. The container is 6 in. deep, 2.4 in. across at the base, and 3.2 in. across at the top. A straw sticks up 1 in. above the top. How much work does it take to suck up the beverage through the straw (neglecting friction)?



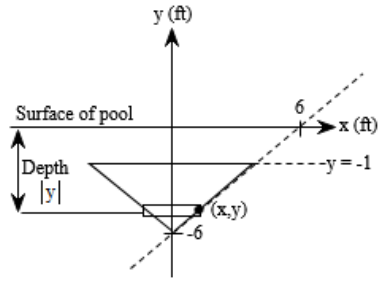

How much work is required?

48.4 in-oz.
(Round to the nearest tenth as needed.)

**Score:** 1 of 1 pt | 24 of 31 | **Test Score:** 86.9

6.5.33

Calculate the fluid force on one side of the plate using the coordinate system shown below. Assume the density is $62.4\ \text{lb/ft}^3$.




The fluid force on one side of the plate is 4160 lb.

**Score:** 1 of 1 pt | 25 of 31 | **Test Score:** 86.9%, 26.94 of 31 pts

6.5.39

Question Help

The viewing portion of the rectangular glass window in a fish tank is 75 inches wide and runs from 0.5 inch below the water's surface to 27.5 inches below the surface. Find the fluid force against this portion of the window. The weight-density of seawater is $64\ \text{lb/ft}^3$.

What is the fluid force against the window?

1050 lb

**Score:** 1 of 1 pt | 26 of 31 | **Test Score:** 86.9%,

6.6.1

Que

Find the center of mass of a thin plate of constant density $\delta$ covering the region bounded by the parabola $y = 4x^2$ and the line $y = 16$.

The center of mass is located at $(\bar{x}, \bar{y})$ = (0,9.6).
(Simplify your answer. Type an ordered pair.)

**Score:** 0 of 1 pt | 27 of 31 | **Test Score:** 86.9%, 26.94 of 31 p

6.6.7

Question Help

Find the center of the mass of a thin plate of constant density $\delta$ covering the region bounded by the x-axis and the curve $y = 2\cos x$, $-\frac{\pi}{7} \le x \le \frac{\pi}{7}$.

The center of the mass is located at $(\bar{x}, \bar{y})$ = (0,0.97).
(Type an ordered pair. Round to the nearest hundr[illegible])

You answered: (0,1.94)
Get answer feedback

**Score:** 1 of 1 pt | 28 of 31 | **Test Score:** 86.9%, 26

6.6.13

Find the center of mass of a thin plate covering the region between the x-axis and the curve $y = \frac{20}{x^2}$, $6 \le x \le 10$, if the plate's density at a point (x,y) is $\delta(x) = 2x^2$.

The center of mass is $(\bar{x}, \bar{y}) = \left(8, \frac{1}{6}\right)$.

(Type an ordered pair. Type integers or simplified fractions.)

**Score:** 1 of 1 pt | 29 of 31 | **Test Score:** 86.9%, 26.94 of 31 pts

6.6.19

Question Help

Using the fact that the centroid of a triangle lies at the intersection of the triangle's medians, which is the point that lies one-third of the way from each side toward the opposite vertex, find the centroid of the triangle whose vertices are (0,0), (1,0), and (0,7).

The centroid of the triangle is $(\bar{x}, \bar{y})$, where $\bar{x} = \frac{1}{3}$ and $\bar{y} = \frac{7}{3}$.

(Type integers or simplified fractions.)

**Score:** 1 of 1 pt | 30 of 31 | **Test Scc**

6.6.23

Find the moment about the x-axis of a wire of constant density that lies along the curve $y = \sqrt{3x}$ from $x = 0$ to $x = 9$.

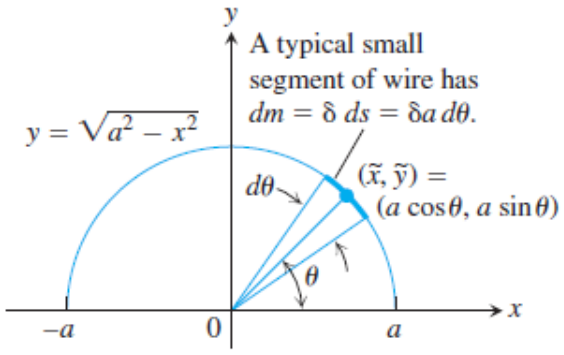
The moment is 34.4 $\delta$.

(Round to the nearest tenth as needed.)

**Score:** 1 of 1 pt | 31 of 31

6.6.25

Find the center of mass (centroid) of a thin wire of density $\delta = k \sin\theta$ (k constant) shaped like a semicircle of radius a.




Determine the coordinates for the center of mass. Determine $\bar{x}$.

$\bar{x} = 0$ (Type an exact answer, using $\pi$ as needed.)

Determine $\bar{y}$.

$\bar{y} = \frac{\pi a}{4}$ (Type an exact answer, using $\pi$ as needed.)