# 3.8 Finding Volumes of 3-Dimensional 



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Old Prisms \& Cylinders
Find the Volume of the Prism.
(1)


$$
\begin{aligned}
\text { Volume } & =\text { Base } * \text { height } \\
& =(8.5 \mathrm{ft}(3.2 \mathrm{ft}) *(13.7 \mathrm{ft}) \\
& \approx 372.64 \mathrm{ft}^{3} .
\end{aligned}
$$

Find the volume of the Cylinder.

$$
\begin{aligned}
\text { Volume } & =\text { Base } * \text { height } \\
& =\pi r^{2} * h \\
& =\pi(5 \mathrm{~cm})^{2} *(10 \mathrm{~cm}) \\
& \approx 785.4 \mathrm{~cm}^{3}
\end{aligned}
$$

new Pyramids \& Cones
Let's consider a rectangle where one part of the figure is shaded.


Find the area of the shaded region.

$$
\begin{aligned}
& \text { Area }=\text { Length * Width } \\
& \text { Area of Shaded }\left(\frac{1}{3}\right)(\text { Length })(\text { Width })
\end{aligned}
$$

Let's consider a prism where one part of the solid is shaded.


Find the volume of the shaded region.
Volume = Base *height
Volume of Shaded $=\left(\frac{1}{3}\right)($ Base $) *$ (height)

PyRAMID


$$
\begin{aligned}
& \text { Volume }=\left(\frac{1}{3}\right) \text { Area } * \text { depth } \\
& \text { Volume }=\left(\frac{1}{3}\right)(\text { Base }) *(\text { height })
\end{aligned}
$$

[Example] Find the volume of the pyramid.


$$
\begin{aligned}
\text { Volume } & =\frac{1}{3}(\text { Base })(\text { height }) \\
& =\frac{1}{3}(5)(5) *(10) \\
& \approx 83.33 \text { units }^{3}
\end{aligned}
$$

Let's consider a circle where one part of the figure is shaded.


Find the area of the shaded region.
Area $=\pi r^{2}$
Area of Shaded $=\left(\frac{1}{3}\right) \pi r^{2}$
Let's consider a prism where one part of the solid is shaded.


Find the volume of the shaded region.
Volume $=$ Base $*$ height
Volume of Shaded $=\left(\frac{1}{3}\right)$ (Base) $*$ (height)


$$
\begin{aligned}
& \text { Volume }=\left(\frac{1}{3}\right) \text { Area } * \text { depth } \\
& \text { Volume }=\left(\frac{1}{3}\right)(\text { Base }) *(\text { height })
\end{aligned}
$$

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[Example] Find the volume of the cone.


$$
\begin{aligned}
\text { Volume } & =\frac{1}{3}(\text { Duse }) *(\text { height }) \\
& =\frac{1}{3}\left(\pi(2 \mathrm{mi})^{2}\right) *(5 \mathrm{mi}) \\
& \approx 20.9 \mathrm{mi}^{3}
\end{aligned}
$$

