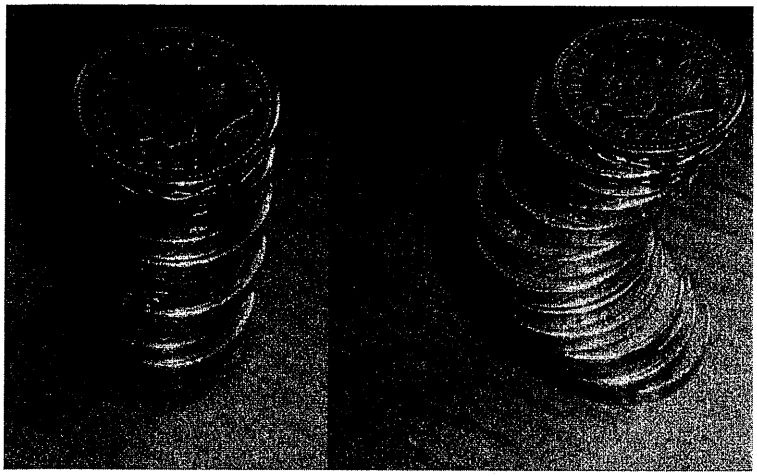
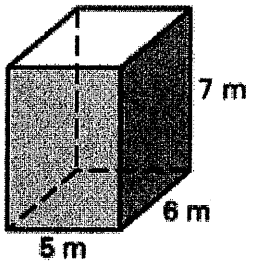
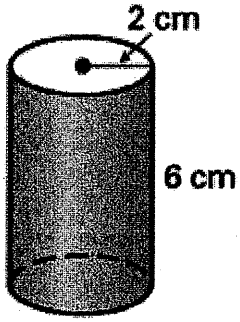
- **2-dimensional case**: Suppose two regions in a plane are included between two parallel lines in that plane. If every line parallel to these two lines intersects both regions in line segments of equal length, then the two regions have equal areas.
- **3-dimensional case**: Suppose two regions in three-space (solids) are included between two parallel planes. If every plane parallel to these two planes intersects both regions in cross-sections of equal area, then the two regions have equal volumes.



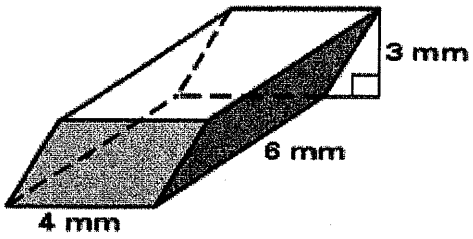
1. Find the volume of the right prism



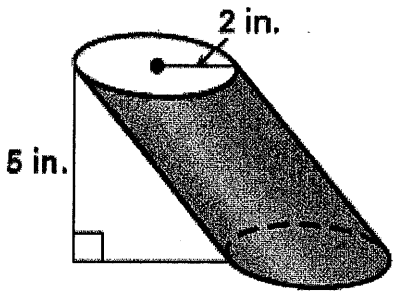
Find the volume of the right cylinder.



Use **Cavalieri's principle** to find the volume of the oblique prism



Use **Cavalieri's principle** to find the volume of the oblique cylinder



Geometry Cavalieri's principle notes

- **2-dimensional case**: Suppose two regions in a plane are included between two parallel lines in that plane. If every line parallel to these two lines intersects both regions in line segments of equal length, then the two regions have equal areas.
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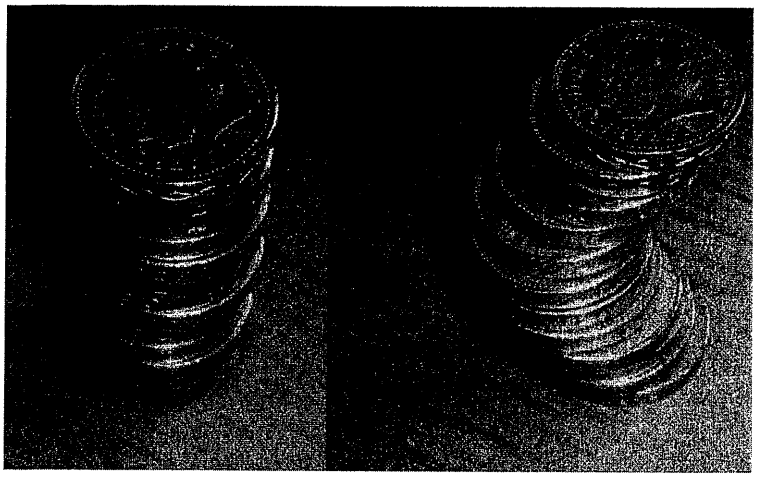
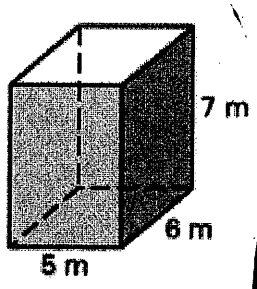


1. Find the volume of the right prism

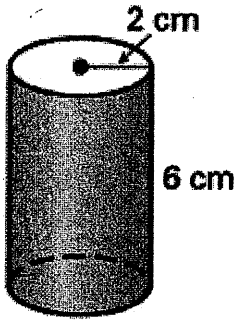


$V = B \cdot h$

$V = 30.7$

$V = 210$

Find the volume of the right cylinder.



$V = \pi r^2 h$

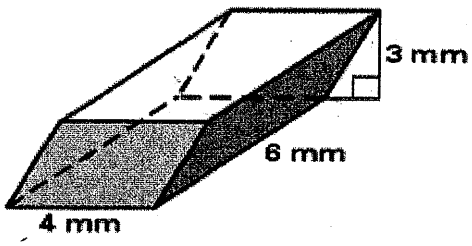
$= \pi(2)^2(6)$

$V = 24\pi$

$V = 24\pi$

$V = 24\pi$

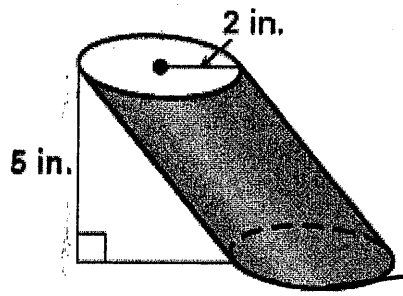
Use **Cavalieri's principle** to find the volume of the oblique prism



$V = B \cdot h$

$24.3 = 72$

Use **Cavalieri's principle** to find the volume of the oblique cylinder



$V = \pi r^2 h$

$V = \pi(2)^2(5)$

$V = 20\pi$

$V = \pi r^2 h$

$V = \pi(2)^2(5)$

$V = 20\pi$