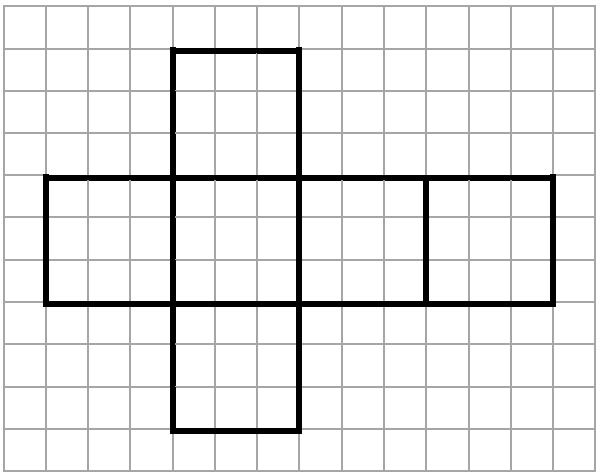
Volume of Prisms and Cylinders

Extend Your Learning
Answers and Explanations

Determine the volume of each prism that can be formed with the following nets. You may want to cut out and fold the nets to help you determine your answer. Explain how you determined your answers.

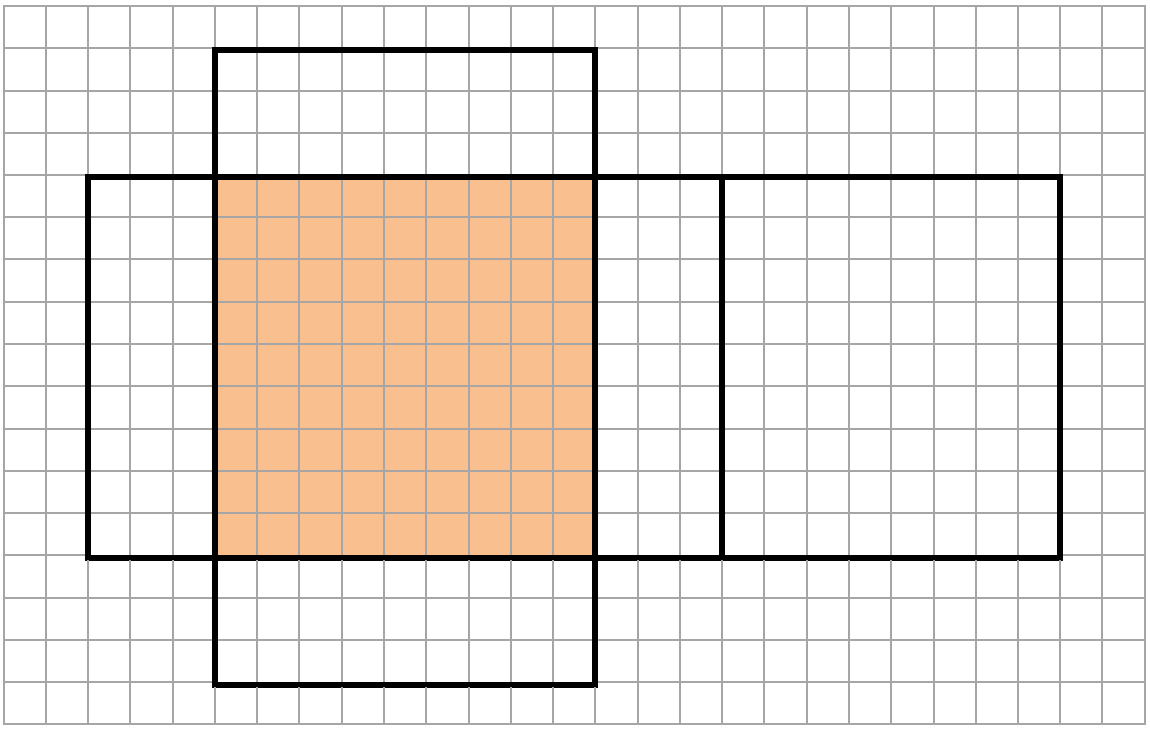
Net 1:



When folded, this net forms a cube and each edge measures 3 units. You may think of any face as the base of the cube. The area of the base of the cube is 9 square units and the volume of the cube is 27 cubic units.

$V = Bh$
$= 3 \cdot 3 \cdot 3$
$= 27$ cubic units

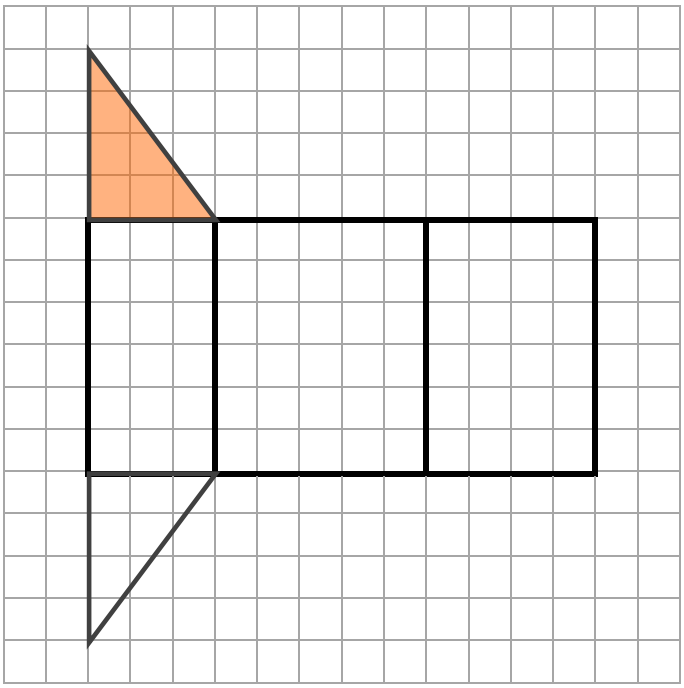
Net 2:



When folded, this net forms a rectangular prism. You may think of any of the faces as the base. If you think of the shaded face as the base, the area of the base is 81 square units and the height is 3 units. The volume of the prism is 243 cubic units.

$V = Bh$
$= 9 \cdot 9 \cdot 3$
$= 243$ cubic units

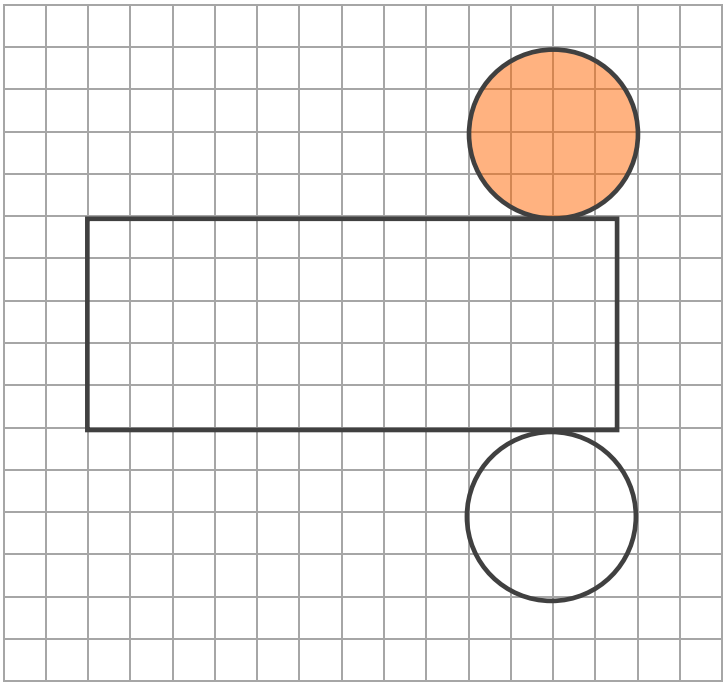
Net 3:



When folded, this net forms a triangular prism, so the base is a triangle. The base of the triangle is 3 units and the height of the triangle is 4 units. The area of the triangle (base of the prism) is 6 square units. The height of the prism is 6 units and the volume is 36 cubic units.

$$V = Bh$$
$$= \left(\frac{1}{2} \cdot 3 \cdot 4\right) 6$$
$$= 6 \cdot 6$$
$$= 36 \text{ cubic units}$$

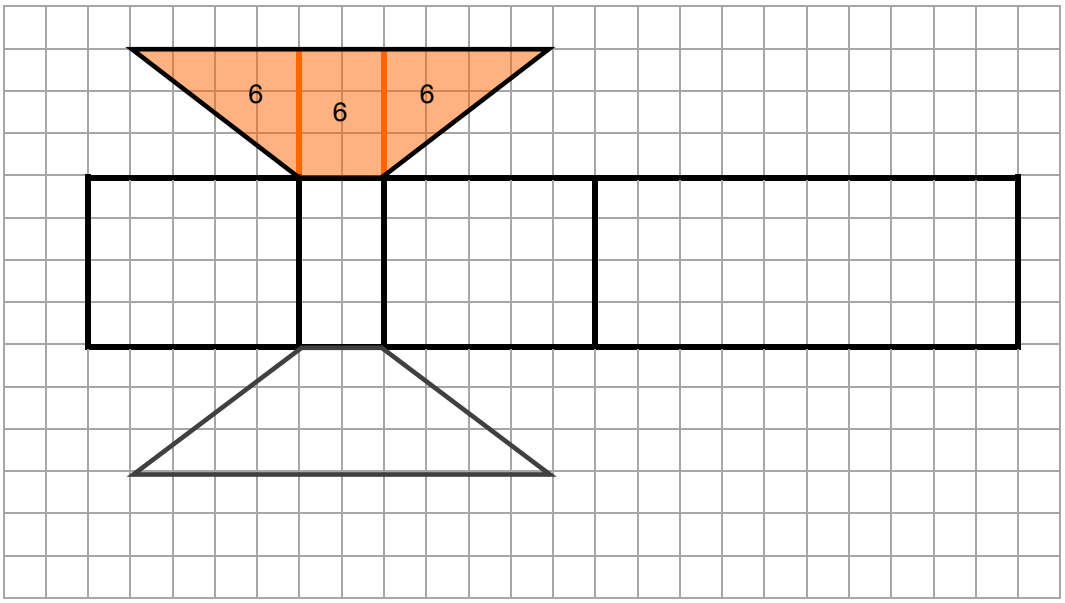
Net 4:



When folded, this net forms a cylinder, so the base is a circle. The radius of the circle is 2 units so the area of the circle is $\pi \cdot 2^2$, or 4π square units. The height of the prism is 5 units and the volume is 20π cubic units, or approximately 62.83 cubic units.

$$V = Bh$$
$$= (4\pi)\ 5$$
$$= 20\pi \text{ cubic units}$$
$$\approx 62.83 \text{ cubic units}$$

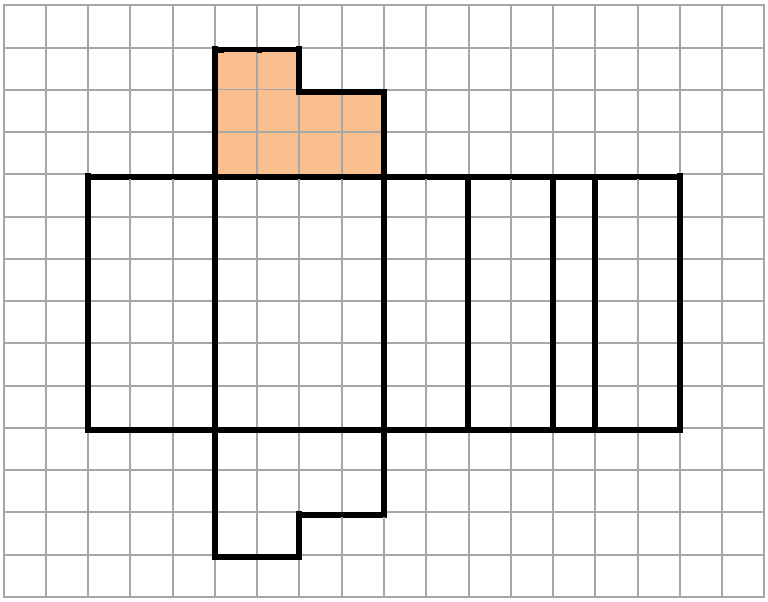
Net 5:



When folded, this net forms a trapezoidal prism, so the base is a trapezoid. You may determine the area of the trapezoid by finding the area of each of the three regions shown above, 6 + 6 + 6 = 18 square units, or by using the formula for area of a trapezoid, ½ (2 + 10) • 3 = 18 square units. The height of the prism is 4 units. The volume of the prism is 72 cubic units.

$V = Bh$
$= 18 \cdot 4$
$= 72$ cubic units

Net 6:



When folded, the base of this net has six sides, so it is a hexagonal prism. One way to determine the area of the base is to count the shaded squares. The area of the base is 10 square units and the height of the prism is 6 units. The volume of the prism is 60 cubic units.

$V = Bh$
$= 10 \cdot 6$
$= 60$ cubic units