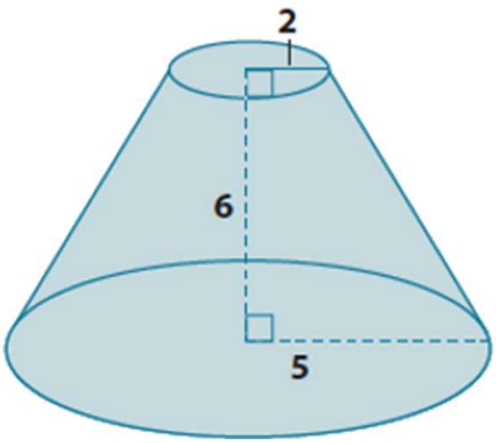
Volume of Truncated Cone

1. Find the volume of the truncated cone.



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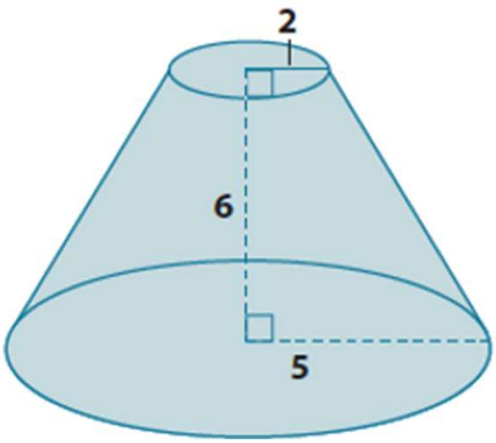

Let x represent the height of the small cone.

$$\frac{2}{5} = \frac{x}{x+6}$$
$$2(x+6) = 5x$$
$$2x + 12 = 5x$$
$$12 = 3x$$
$$4 = x$$

The volume of the small cone is

$$V = \frac{1}{3}\pi(2)^2(4)$$
$$= \frac{16}{3}\pi.$$

The volume of the large cone is

$$V = \frac{1}{3}\pi(5)^2(10)$$
$$= \frac{250}{3}\pi.$$

The volume of the truncated cone is

$$\frac{250}{3}\pi - \frac{16}{3}\pi$$
$$= \left(\frac{250}{3} - \frac{16}{3}\right)\pi$$
$$= \frac{234}{3}\pi = 78\pi.$$

The volume of the truncated cone is $78\pi\ units^3$.