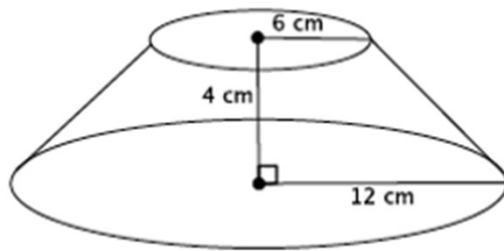# Volume of Truncated Cone

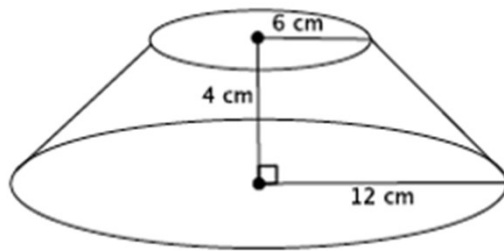1. Find the volume of the truncated cone.

a) Write a proportion that will allow you to determine the height of the cone that has been removed. Explain what all parts of the proportion represent.

b) Solve your proportion to determine the height of the cone that has been removed.

c) Calculate the volumes of the large cone, small cone and the truncated cone

Volume of Truncated Cone

1. Find the volume of the truncated cone.

a) Write a proportion that will allow you to determine the height of the cone that has been removed. Explain what all parts of the proportion represent.

$$\frac{6}{12} = \frac{x}{x+4}$$

Let x cm represent the height of the small cone. Then, $x + 4$ is the height of the large cone (with the removed part included). The 6 represents the base radius of the removed cone, and the 12 represents the base radius of the large cone.

b) Solve your proportion to determine the height of the cone that has been removed.

$$6(x+4) = 12x$$
$$6x + 24 = 12x$$
$$24 = 6x$$
$$4 = x$$

c) Calculate the volumes of the large cone, small cone and the truncated cone

The volume of the large cone is
$$V = \frac{1}{3}\pi(12)^2(8)$$
$$= \frac{1152}{3}\pi.$$

The volume of the small cone is
$$V = \frac{1}{3}\pi(6)^2(4)$$
$$= \frac{144}{3}\pi.$$

The volume of the truncated cone is
$$\frac{1152}{3}\pi - \frac{144}{3}\pi$$
$$= \left(\frac{1152}{3} - \frac{144}{3}\right)\pi$$
$$= \frac{1008}{3}\pi$$
$$= 336\pi.$$

The volume of the truncated cone is 336π cm^3.

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