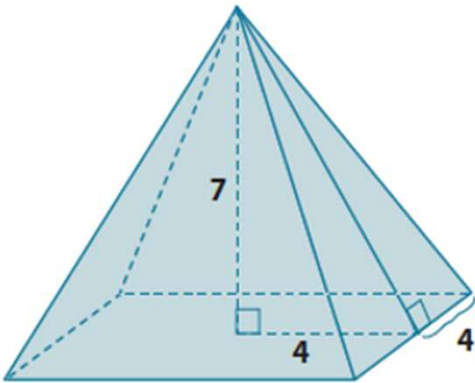
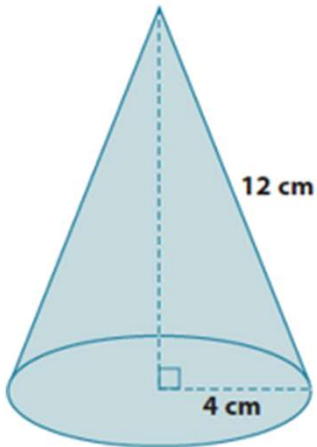


Pythagorean Theorem in 3D Solids

1. Determine the volume and surface area of the square pyramid shown below. Give exact answers.



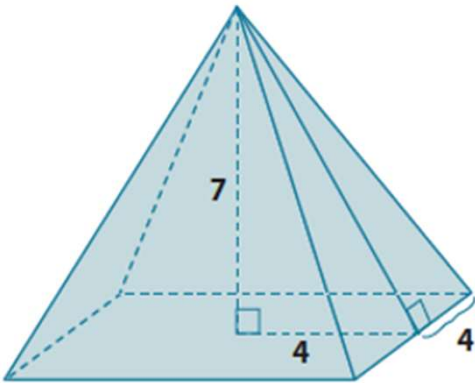
2. What is the volume of the cone shown below? Give an exact answer.



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Pythagorean Theorem in 3D Solids

1. Determine the volume and surface area of the square pyramid shown below. Give exact answers.



$$V = \frac{1}{3}(64)(7) = \frac{448}{3}$$

The volume of the pyramid is $\frac{448}{3}$ units³.

Let c represent the lateral length.

$$7^2 + 4^2 = c^2$$

$$49 + 16 = c^2$$

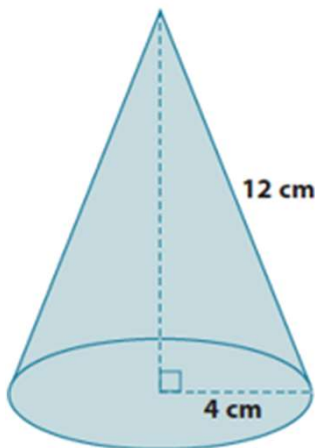
$$65 = c^2$$

$$\sqrt{65} = \sqrt{c^2}$$

$$\sqrt{65} = c$$

The area of each face of the pyramid is $4\sqrt{65}$ units² (since $\frac{1}{2} \times 8 \times \sqrt{65} = 4\sqrt{65}$), so the area of all four faces is $16\sqrt{65}$ units². Since the base area is 16 units², the total surface area of the pyramid is $(16 + 16\sqrt{65})$ units².

2. What is the volume of the cone shown below? Give an exact answer.



Let h cm represent the height.

$$4^2 + h^2 = 12^2$$

$$16 + h^2 = 144$$

$$h^2 = 128$$

$$\sqrt{h^2} = \sqrt{128}$$

$$h = \sqrt{128}$$

$$h = \sqrt{8^2 \times 2}$$

$$h = 8\sqrt{2}$$

$$V = \frac{1}{3}\pi(4)^2(8\sqrt{2})$$

$$V = \frac{1}{3}\pi(128\sqrt{2})$$

$$V = \frac{128\sqrt{2}}{3}\pi$$

The volume of the cone is $\frac{128\sqrt{2}}{3}\pi$ cm³.