

1. An open-top box with a square base is to be constructed from a sheet metal in such a way that the completed box is made of 10m^2 of sheet metal. Express the volume of the box as a function of the base width.

2. A rectangular solid has a surface area of 300m^2 . The length of the base is three times the width. Find the volume of the solid in terms of the width.

3. A coke can is constructed from 50 in^2 sheet of metal. Find the volume of the can in terms of its radius

4. A cylinder has a volume of 50 cm^3 . Find the surface area in terms of its radius

5. A cylindrical can has a volume of $400\pi \text{ cm}^3$. Express the surface area in terms of its radius.

6. A light 40 ft above the ground causes a child 4ft tall to cast a shadow x ft long on the ground. Express x as a function of d (the child's distance from the light).

7. A light on the ground is 40 ft from a building. A 10 ft tree is standing between the light and the building and casts a shadow on the building. Express the height of the shadow (h), as a function of the tree's distance (x) from the building.

Answers:

$$1. V = \frac{x(10 - x^2)}{4}$$

$$2. V = \frac{3x(150 - 3x^2)}{4}$$

$$3. V = x(25 - \pi x^2)$$

$$4. V = 2\pi x^2 + \frac{100}{x}$$

$$5. V = 2\pi x^2 + \frac{800\pi}{x}$$

$$6. x = \frac{d}{9}$$

$$7. h = \frac{400}{40 - x}$$

Check solution guide for textbook answers.