

GMF Lesson 4 Surface Area Problems

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. The exterior of a lamp post is to be painted. The lamp post is a 14-foot tall cylinder with a diameter of 18 inches. Since the base is on the ground and the top is covered by a floodlight, you will not need to paint these pieces. What is the area that needs to be painted?
- | | |
|------------------------|-------------------------|
| a. 113 in^2 | c. 792 in^2 |
| b. 9500 in^2 | d. 10009 in^2 |

Short Answer

2. A regular tetrahedron has edge length 20.0 m and a slant height of 17.3 m. Calculate the surface area of the tetrahedron to the nearest square metre.
3. A right cone has a height of 15 in. and a base diameter of 8 in. Determine the lateral area of the cone to the nearest square inch.
4. In 2008, the Queen Sesheshet Pyramid was discovered in Egypt. Archeologists determined that the original height of this right square pyramid was about 14 m and the original base side length was about 22 m. Determine its original lateral area to the nearest square metre.
5. The surface area of a tennis ball is approximately 23 square inches. What is the diameter of the tennis ball to the nearest inch?
6. A stadium has a roof that approximates a hemisphere with circumference 2500 ft. Determine the surface area of the roof to the nearest square foot.
7. Horatio is wallpapering his room. His room measure 5 m long by 4.75 m wide by 3.25 m high. There are two windows that measure 1 m by 0.75 m and a door that is 1.3 m by 2.75 m, each of which do not require wallpaper. How much wallpaper is needed for Horatio's room?
8. A company is selling decorative Christmas tree covers. After doing some research, the company finds that the average tree measures 6.5 feet high, has a diameter of 3.5 feet, and a slant height of 6.7 feet. How much material will be needed for the cover? Round to the nearest square foot.

GMF Lesson 4 Surface Area Problems Answer Section

MULTIPLE CHOICE

1. ANS: B

SHORT ANSWER

2. ANS:
692 m²
3. ANS:
195 square inches
4. ANS:
783 m²
5. ANS:
3 in.
6. ANS:
1 492 078 square feet
7. ANS:
Calculate the surface area of the walls, ignoring the windows.

There are 2 walls that are 5 m long by 3.25 m high.

$$A_1 = 2(l \times h)$$

$$A_1 = 2(5 \times 3.25)$$

$$A_1 = 32.5 \text{ m}^2$$

There are 2 walls that are 4.75 m wide by 3.25 m high.

$$A_2 = 2(w \times h)$$

$$A_2 = 2(4.75 \times 3.25)$$

$$A_2 = 30.875 \text{ m}^2$$

Calculate the area that will not be wallpapered.

$$A_{\text{door}} = l \times w$$

$$A_{\text{door}} = 1.3 \times 2.75$$

$$A_{\text{door}} = 3.575 \text{ m}^2$$

There are 2 windows that are 1 m by 0.75 m.

$$A_{\text{window}} = 2(l \times w)$$

$$A_{\text{window}} = 2(1 \times 0.75)$$

$$A_{\text{window}} = 1.5 \text{ m}^2$$

Calculate the total area to be wallpapered.

$$A_{\text{total}} = A_1 + A_2 - A_{\text{door}} - A_{\text{window}}$$

$$A_{\text{total}} = 32.5 + 30.875 - 3.575 - 1.5$$

$$A_{\text{total}} = 58.3 \text{ m}^2$$

The total area to be wallpapered is 58.3 m².

8. ANS:

A Christmas tree is roughly a cone. Calculate the surface area of the cone, not including the bottom.

$$A = \pi r s$$

$$A = \pi \left(\frac{3.5}{2} \right) (6.7)$$

$$A \approx 37$$

37 ft² of material will be needed to make one tree cover.