

Flash Cards: Finding the Surface Area of Prisms and Cylinders

Directions: For each three-dimensional figure, find the surface area.

1. A rectangular prism with dimensions 4 by 5 by 3.
2. A rectangular prism with front face that has congruent sides measuring 6.5 and third dimension is 2.7.
3. A triangular prism with right triangular face with legs measuring 8 feet and 15 feet, and distance between triangular faces measuring 3 feet.
4. A triangular prism with equilateral triangular face with sides measuring 7 inches and distance between triangular faces measuring 3 inches.
5. A cylinder with radius 15 centimeters and height 21 centimeters.
6. A cylinder with diameter 9 feet and height 7.8 feet.

Answers:

1. 1. Draw and label the surfaces of the figure.

This was done in the last set of Flash Cards.

2. Find the area of each surface of the rectangular prism.

There are two surfaces with dimensions 4 by 5.

$$A = 4(5) = 20$$

There are two surfaces with dimensions 5 by 3.

$$A = 5(3) = 15$$

There are two surfaces with dimensions 4 by 3.

$$A = 4(3) = 12$$

3. Add the areas together.

$$2(20) + 2(15) + 2(12) =$$

$$40 + 30 + 24 =$$

$$94$$

4. Label the answer with 'square units'.

The total surface area is 94 units².

2. 1. Draw and label the surfaces of the figure.

This was done in the last set of Flash Cards.

2. Find the area of each surface of the square prism.

There are two surfaces with dimensions 6.5 by 6.5.
 $A = 6.5(6.5) = 42.25$

There are two surfaces with dimensions 2.7 by 6.5.
 $A = 6.5(2.7) = 17.55$

There are two more surfaces with dimensions 6.5 by 6.5.
 $A = 6.5(6.5) = 42.25$

3. Add the areas together.
 $2(42.25) + 2(17.55) + 2(42.25) =$
 $84.5 + 35.1 + 84.5 =$
204.1

4. Label the answer with 'square units'.

The total surface area is 204.1 units².

3. 1. Draw and label the surfaces of the figure.

This was done in the last set of Flash Cards.

2. Find the area of each surface of the right triangular prism.

There are two triangular surfaces with height 15 ft and base (length) 8 ft.
 $A = \text{one-half time } 8 \text{ times } 15 = 60$

There is one rectangular surface with dimensions 8 ft by 3 ft
 $A = 8(3) = 24$

There is one rectangular surface with dimensions 15 ft by 3 ft.
 $A = 15(3) = 30$

There is one rectangular surfaces. We know the width (3 ft), but we needed to find the length. We found this in the last set of flash cards using the Pythagorean Theorem. The dimension was 17.

$A = 17(3) = 51$

3. Add the areas together.

$24 + 30 + 2(60) + 51 =$
 $24 + 30 + 120 =$
174

4. Label the answer with 'square units'.

The total surface area is 174 ft².

4. 1. Draw and label the surfaces of the figure.

This was done in the last set of Flash Cards.

2. Find the area of each surface of the isosceles triangular prism.

There are two triangular surfaces. We know the base (7 ft), but we needed to find the height. We did this in the last set of flash cards using the Pythagorean Theorem. The height of these triangles is about 6.06.

$$A = \text{one-half times } 7 \text{ times } 6.06 = 21.21$$

There are three rectangular surfaces with dimensions 7 in by 3 in (diagonal sides)

$$A = 7(3) = 21$$

3. Add the areas together.

$$3(21) + 2(21.21) =$$

$$42 + 21 + 42.42 =$$

$$105.42$$

4. Label the answer with 'square units'.

The total surface area is 105.42 in^2 .

5. 1. Draw and label the surfaces of the figure.

This was done in the last set of Flash Cards.

2. Find the area of each surface of the cylinder.

The top and bottom surfaces are circles with radius 15 cm.

$$A = \pi r^2$$

$$A = \pi(15)^2$$

$$A = 225\pi$$

The dimensions of the curved surface of the cylinder are 21 cm by 30π cm.

$$A = 21(30\pi)$$

$$A = 630\pi$$

3. Add the areas together.

$$2(225\pi) + 630\pi$$

$$450\pi + 630\pi$$

$$1080\pi$$

4. Label the answer with 'square units'.

The total surface area is $1080\pi \text{ cm}^2$.
(This is approximately 3392.92 cm^2)

6. 1. Draw and label the surfaces of the figure.

This was done in the last set of Flash Cards.

2. Find the area of each surface of the cylinder.

The top and bottom surfaces are circles with diameter 9 ft, which makes the radius 4.5 ft.

$$A = \pi r^2$$

$$A = \pi (4.5)^2$$

$$A = 20.25\pi$$

The dimensions of the curved surface of the cylinder are 7.8 cm by 9π cm.

$$A = 7.8(9\pi)$$

$$A = 70.2\pi$$

3. Add the areas together.

$$2(20.25\pi) + 70.2\pi$$

$$40.5\pi + 70.2\pi$$

$$110.7\pi$$

4. Label the answer with 'square units'.

The total surface area is 110.7π ft².

(This is approximately 347.77 ft².)