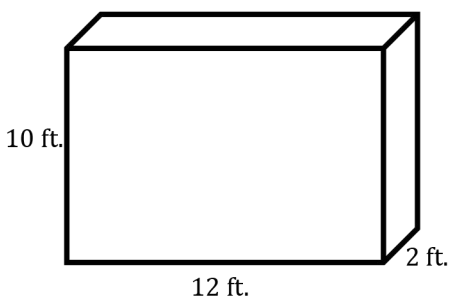
Name _____ Date _____

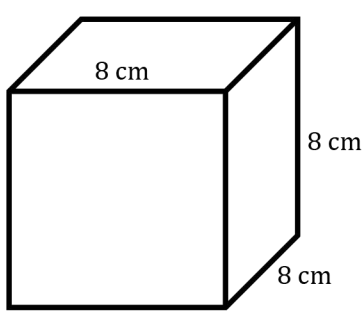
Determining Surface Area of Three-Dimensional Figures

Calculate the surface area of each figure below. Figures are not drawn to scale.

1.

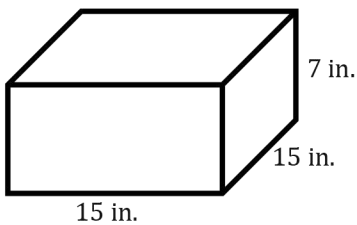


2.

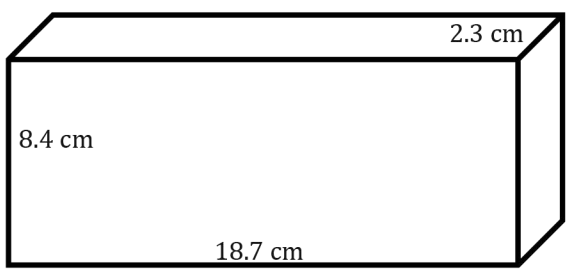


Calculate the surface area of each figure below. Figures are not drawn to scale.

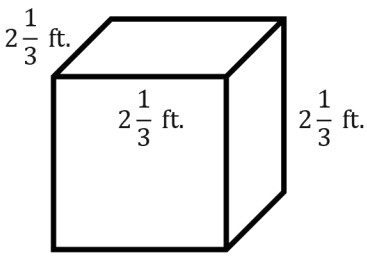
1.



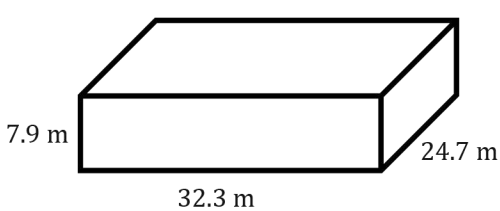
2.



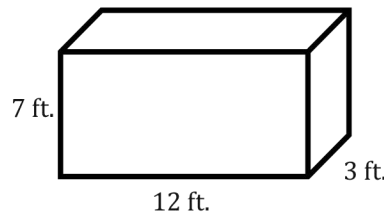
3.



4.



5. Write a numerical expression to show how to calculate the surface area of the rectangular prism. Explain each part of the expression.



6. When Louie was calculating the surface area for Problem 4, he identified the following:

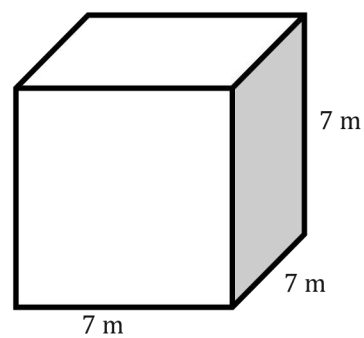
$$\text{length} = 24.7 \text{ m}, \text{ width} = 32.3 \text{ m}, \text{ and height} = 7.9 \text{ m}.$$

However, when Rocko was calculating the surface area for the same problem, he identified the following:

$$\text{length} = 32.3 \text{ m}, \text{ width} = 24.7 \text{ m}, \text{ and height} = 7.9 \text{ m}.$$

Would Louie and Rocko get the same answer? Why or why not?

7. Examine the figure below.



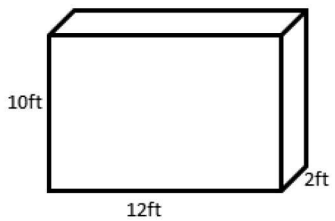
a. What is the most specific name of the three-dimensional shape?

b. Write two different expressions for the surface area.

c. Explain how these two expressions are equivalent.

Calculate the surface area of each figure below. Figures are not drawn to scale.

1.



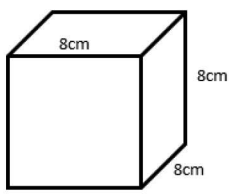
$$SA = 2lw + 2lh + 2wh$$

$$\text{SA} = 2(12\text{ ft.})(2\text{ ft.}) + 2(12\text{ ft.})(10\text{ ft.}) + 2(2\text{ ft.})(10\text{ ft.})$$

$$SA = 48\text{ ft}^2 + 240\text{ ft}^2 + 40\text{ ft}^2$$

$$SA = 328\text{ ft}^2$$

2.



$$SA = 6s^2$$

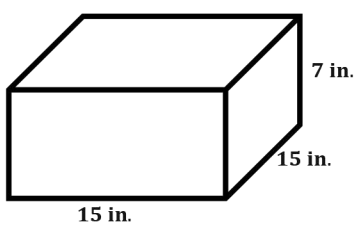
$$SA = 6(8\text{ cm})^2$$

$$SA = 6(64\text{ cm}^2)$$

$$SA = 384\text{ cm}^2$$

Calculate the surface area of each figure below. Figures are not drawn to scale.

1.

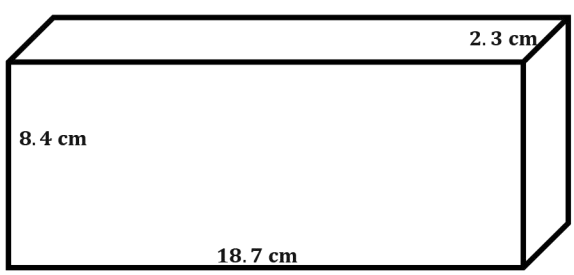


$$SA = 2(15\text{ in.})(15\text{ in.}) + 2(15\text{ in.})(7\text{ in.}) + 2(15\text{ in.})(7\text{ in.})$$

$$SA = 450\text{ in}^2 + 210\text{ in}^2 + 210\text{ in}^2$$

$$SA = 870\text{ in}^2$$

2.

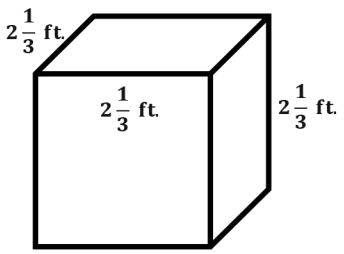


$$SA = 2(18.7\text{ cm})(2.3\text{ cm}) + 2(18.7\text{ cm})(8.4\text{ cm}) + 2(2.3\text{ cm})(8.4\text{ cm})$$

$$SA = 86.02\text{ cm}^2 + 314.16\text{ cm}^2 + 38.64\text{ cm}^2$$

$$SA = 438.82\text{ cm}^2$$

3.



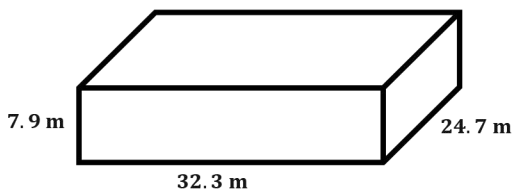
$$SA = 6\left(2\frac{1}{3}\text{ ft.}\right)^2$$

$$SA = 6\left(\frac{7}{3}\text{ ft.}\right)^2$$

$$SA = 6\left(\frac{49}{9}\text{ ft}^2\right)$$

$$SA = \frac{294}{9} = 32\frac{2}{3}\text{ ft}^2$$

4.



$$SA = 2(32.3\text{ m})(24.7\text{ m}) + 2(32.3\text{ m})(7.9\text{ m}) + 2(24.7\text{ m})(7.9\text{ m})$$

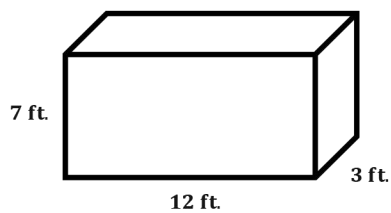
$$SA = 1595.62\text{ m}^2 + 510.34\text{ m}^2 + 390.26\text{ m}^2$$

$$SA = 2496.22\text{ m}^2$$

5. **Write a numerical expression to show how to calculate the surface area of the rectangular prism. Explain each part of the expression.**

$2(12\text{ ft.} \times 3\text{ ft.}) + 2(12\text{ ft.} \times 7\text{ ft.}) + 2(7\text{ ft.} \times 3\text{ ft.})$

The first part of the expression shows the area of the top and bottom of the rectangular prism. The second part of the expression shows the area of the front and back of the rectangular prism. The third part of the expression shows the area of the two sides of the rectangular prism.



The surface area of the figure is 282 ft^2.

6. **When Louie was calculating the surface area for Problem 4, he identified the following:**

length $= 24.7\text{ m}$, **width** $= 32.3\text{ m}$, **and height** $= 7.9\text{ m}$.

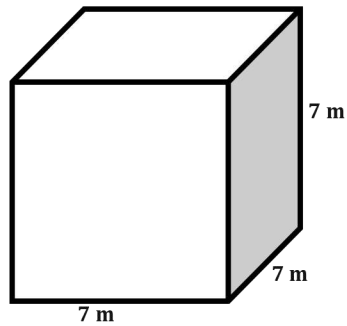
However, when Rocko was calculating the surface area for the same problem, he identified the following:

length $= 32.3\text{ m}$, **width** $= 24.7\text{ m}$, **and height** $= 7.9\text{ m}$.

Would Louie and Rocko get the same answer? Why or why not?

Louie and Rocko would get the same answer because they are still finding the correct area of all six faces of the rectangular prism.

7. **Examine the figure below.**



a. **What is the most specific name of the three-dimensional shape?**

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b. **Write two different expressions for the surface area.**

$(7\text{ m} \times 7\text{ m}) + (7\text{ m} \times 7\text{ m}) + (7\text{ m} \times 7\text{ m}) + (7\text{ m} \times 7\text{ m}) + (7\text{ m} \times 7\text{ m}) + (7\text{ m} \times 7\text{ m})$

$6 \times (7\text{ m})^2$

c. **Explain how these two expressions are equivalent.**

The two expressions are equivalent because the first expression shows $7\text{ m} \times 7\text{ m}$*, which is equivalent to* $(7\text{ m})^2$*. Also, the* 6 *represents the number of times the product* $7\text{ m} \times 7\text{ m}$ *is added together.*