

Challenge Problems

13.3

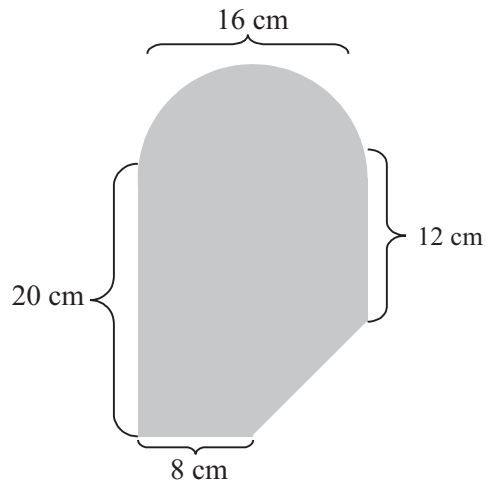
NAME _____

Module 13 Perimeter, Area, and Volume

Lesson 3 Area: Irregular Shapes

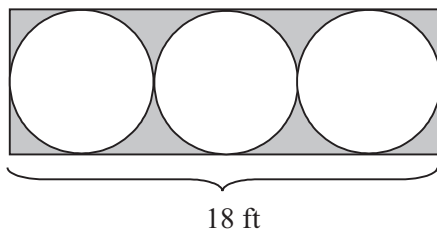
Set 1

- 1 Show two different strategies for estimating the area of the shape.



- 2 Richard is making a circular tabletop with a circumference of 31.4 feet. Can Richard use a square piece of wood that is five feet on each side to make the tabletop? Explain.

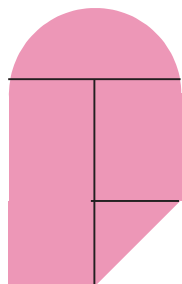
- 3 Estimate the area of the gray region.



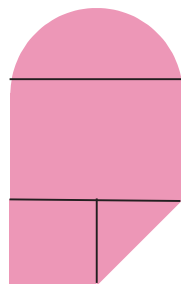
Possible Answers

Set 1

1.



$$\begin{aligned} & \frac{1}{2}\pi(8^2) \\ & (8 \times 20) \\ & \frac{1}{2}(8 \times 8) \\ & + \underline{(12 \times 8)} \\ & \approx 388.48 \text{ cm}^2 \end{aligned}$$



$$\begin{aligned} & \frac{1}{2}\pi(8^2) \\ & (12 \times 16) \\ & \frac{1}{2}(8 \times 8) \\ & + \underline{(8 \times 8)} \\ & \approx 388.48 \text{ cm}^2 \end{aligned}$$

2. Use the circumference to find the diameter of the tabletop. Since $C = \pi \times d$, divide the circumference by π to find the diameter. The diameter of the tabletop is 10 feet. A 10-foot-diameter circle cannot be cut out of a five-foot piece of wood.
3. Circle: $A \approx 3.14(3^2) \approx 28.26 \text{ ft}^2$
 Rectangle: $A = 18 \times 6 = 108 \text{ ft}^2$
 Shaded area: $A \approx 108 \text{ ft}^2 - 3(28.26 \text{ ft}^2) \approx 23.22 \text{ ft}^2$