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Module 13 **Perimeter, Area, and Volume**
Lesson 2 **Area**

Lesson Notes 13.2

Lesson Objectives

- Establish and apply formulas to find the area of triangles and different types of quadrilaterals.
- Develop and use strategies to solve problems involving the area of quadrilaterals and the area of a circle.
- Demonstrate understanding of when to use linear units to describe perimeter and square units to describe area.
- Find different areas for a given perimeter and find different perimeters for a given area.

Subtopic 1 Area of Rectangles and Parallelograms

Area

The number of **square units** or the amount of space in a region

Area of a **Square**

$A = s^2$

Area of a Rectangle

$A = lw$

Area of a Parallelogram

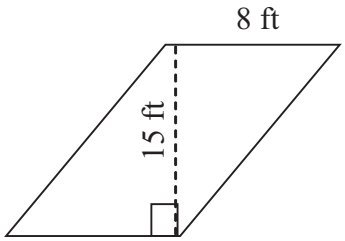
$A = bh$

1 Find the area of the window.

$A = lw$
$A = 2.5(2) = 5$

The area is 5 m^2.

2 Find the area of the parallelogram where the base is eight feet and the height is 15 feet.



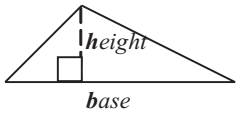
$A = bh$
$A = 8(15) = 120$

The area is 120 ft^2.

Subtopic 2 Area of Triangles, Trapezoids, and Circles

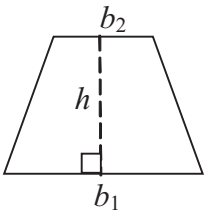
Area of a Triangle

$A = \frac{1}{2}bh$



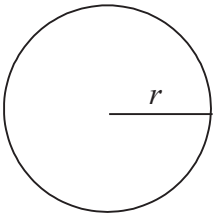
Area of a Trapezoid

$A = \frac{1}{2}(b_1 + b_2)h$

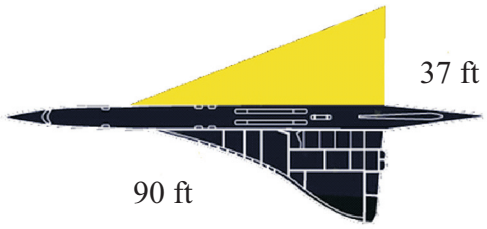


Area of a Circle

$A = \pi r^2$



3 Find the area of the triangular wing of this plane which has a base of 90 feet and a height of 37 feet.



$A = \frac{1}{2}bh$

$A = \frac{1}{2}(90)(37)$

$A = 1{,}665$

The area is 1,665 ft^2.

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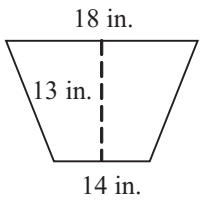
Module 13 Perimeter, Area, and Volume
Lesson 2 Area

4 A cafeteria tray is shaped like a trapezoid. Find the area of the tray.



$$A = \frac{1}{2}(b_1 + b_2)h$$
$$A = \frac{1}{2}(18 + 14)13$$
$$A = \frac{1}{2}(32)13$$
$$A = (16)13 = 208$$

The area is 208 square inches.

5 A circular swimming pool cover has an area of 452.16 square feet. Estimate the diameter of the swimming pool cover.

$$A = \pi r^2$$
$$\frac{452.16}{\pi} = \frac{\pi r^2}{\pi}$$
$$\frac{452.16}{\pi} = r^2$$
$$\frac{452.16}{3.14} \approx r^2$$
$$144 \approx r^2$$
$$12 \approx r$$
$$d \approx 12 \times 2$$
$$d \approx 24$$

The diameter of the pool cover is about 24 feet.

Subtopic 3 Find Different Areas for a Given Perimeter

6 Luria bought an astro-cow. What is the smallest number of one-yard fencing sections she needs to enclose a rectangular pasture containing 36 square yards of astro-turf?

A (yd^2)	Length (yd)	Width (yd)	P (yd)
36	1	36	74
36	2	18	40
36	3	12	30
36	4	9	26
36	**6**	**6**	**24**

The smallest number of sections needed is 24.