# Bellwork
# 04/09/12

**1. What properties make a quadrilateral a parallelogram? (lesson 8.3)**

1. Opposite sides ||
2. Opposite ∠'s ≅
3. Diagonals bisect
4. One pair of sides are ≅ & ||
5. Opposite sides are ≅

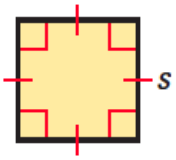
# Geometry
# 11.1 Area of Triangles and Parallelograms
# Standard(s): 3, 4

## Vocabulary:

### POSTULATES — For Your Notebook

**POSTULATE 24 Area of a Square Postulate**

The area of a square is the square of the length of its side.




$A = s^2$

**POSTULATE 25 Area Congruence Postulate**

If two polygons are congruent, then they have the same area.

**POSTULATE 26 Area Addition Postulate**

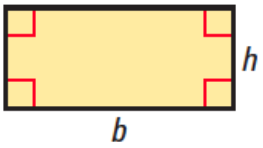
The area of a region is the sum of the areas of its nonoverlapping parts.

### THEOREM — For Your Notebook

**THEOREM 11.1 Area of a Rectangle**

The area of a rectangle is the product of its base and height.

*Justification:* Ex. 46, p. 726



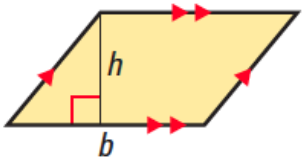

$A = bh$

### THEOREMS — For Your Notebook

**THEOREM 11.2 Area of a Parallelogram**

The area of a parallelogram is the product of a base and its corresponding height.

*Justification:* Ex. 42, p. 725

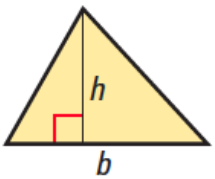



$A = bh$

**THEOREM 11.3 Area of a Triangle**

The area of a triangle is one half the product of a base and its corresponding height.

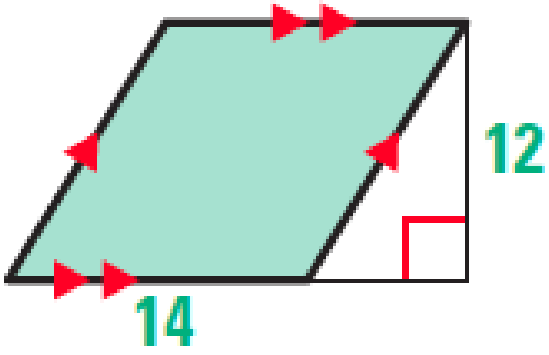
*Justification:* Ex. 43, p. 726




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

# Find Area of Polygons

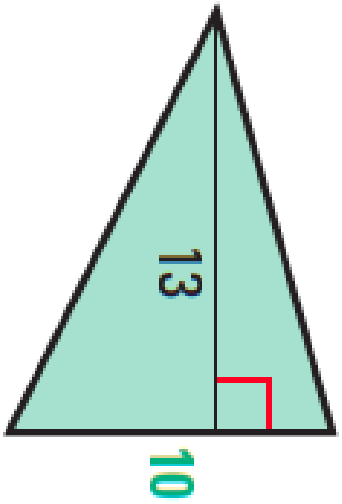
Find the area of the polygon.




$A = b \cdot h$

$A = 14 \cdot 12$

$A = 168 \text{ units}^2$




$A = \frac{b \cdot h}{2}$

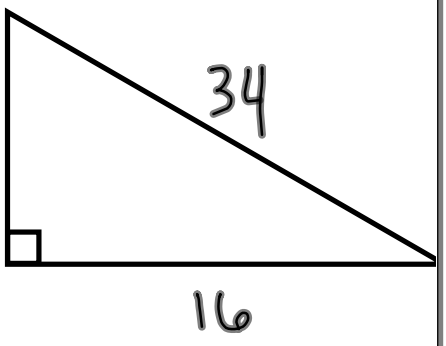
$A = \frac{10 \cdot 13}{2}$

$A = 65 \text{ units}^2$

# Pythagorean Theorem

The lengths of the hypotenuse and one leg of a right triangle are given. Find the perimeter and area of the triangle.

**Hypotenuse: 34 ft.; Leg: 16 ft.**




$34^2 = 16^2 + h^2$ 30 h

$h = 30$

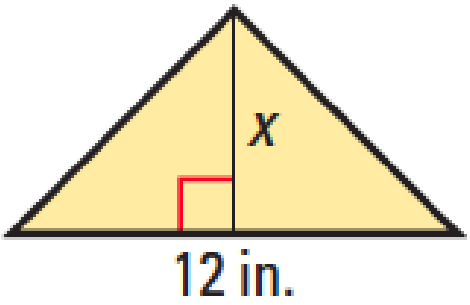
$P = 30 + 34 + 16 = 80 \text{ ft}$

$A = \frac{16 \cdot 30}{2} = 240 \text{ ft}^2$

# Missing Lengths

Find the value of *x*.

$A=36 \text{ in.}^2$

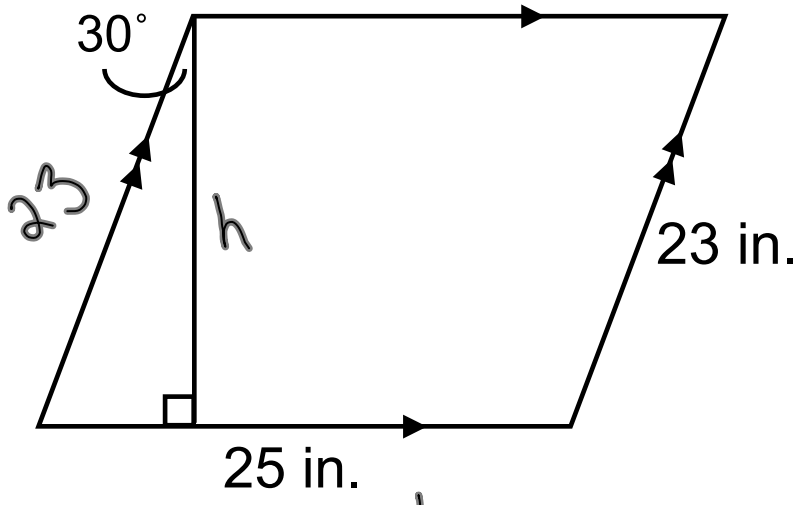



$36 = \frac{12 \cdot x}{2}$

$36 = 6x$

$x = 6$ in.

Find the height and area of the polygon.




$23 \cdot \cos 30 = \frac{h}{23} \cdot 23$

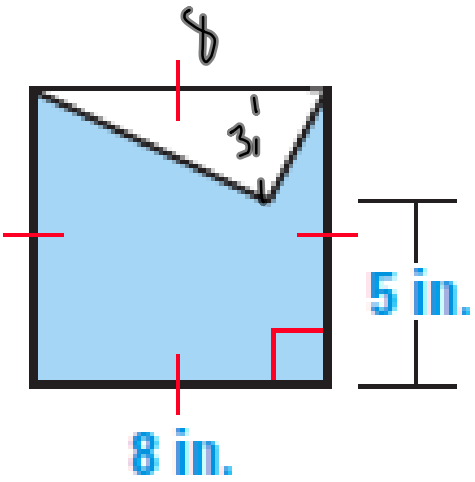
$h = 19.9$ in.

$A = 25 \cdot 19.9$

$A = 498 \text{ in}^2$

# Area of a Region

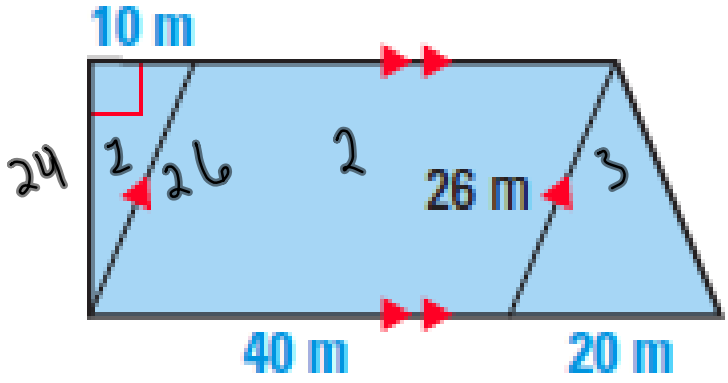
Find the area of the shaded region.




$A = 64 \text{ in}^2$

$A = \frac{8 \cdot 3}{2} = 12 \text{ in}^2$

$64 - 12 = 52 \text{ in}^2$




$26^2 = 10^2 + h^2$

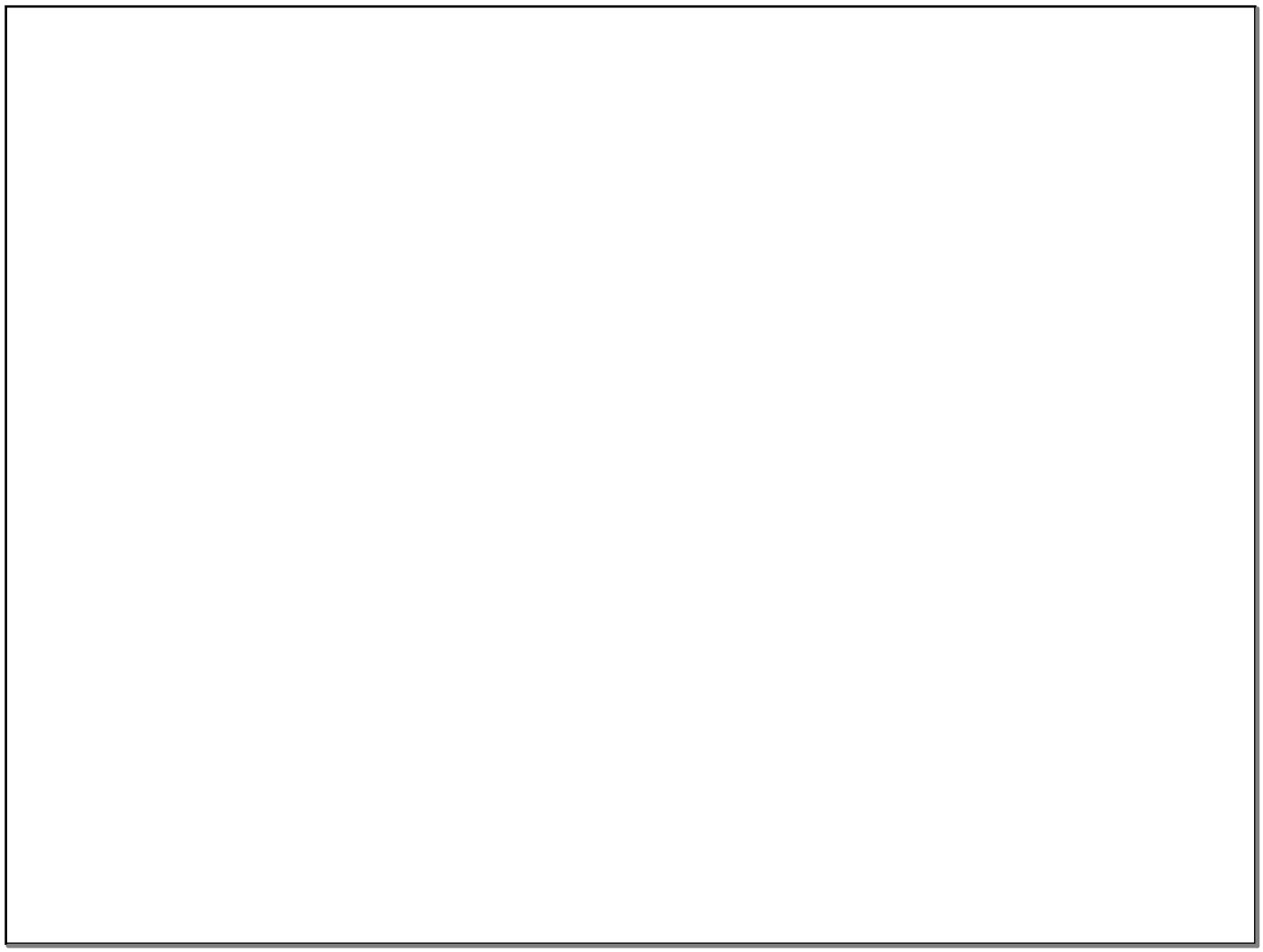
$h = 24$

$A_1 = \frac{10 \cdot 240}{2} = 120 \text{ m}^2$

$A_2 = 40 \cdot 24 = 960 \text{ m}^2$

$A_3 = \frac{20 \cdot 24}{2} = 240 \text{ m}^2$

$1320 \text{ m}^2$

# Homework Assignment

## Worksheet 11.1B