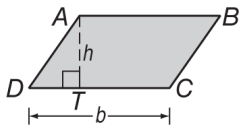
Name _____ Date _____ Period _____

Area Review

Areas of Parallelograms Any side of a parallelogram can be called a **base**. The **height** of a parallelogram is the perpendicular distance between any two parallel bases. The area of a parallelogram is the product of the base and the height.

Area of a Parallelogram	If a parallelogram has an area of A square units, a base of b units, and a height of h units, then $A = bh$.



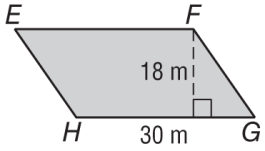
Example: Find the area of parallelogram *EFGH*.

$A = bh$ Area of a parallelogram

$= 30(18)$ $b = 30$, $h = 18$

$= 540$ Multiply.

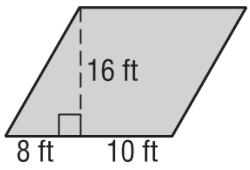
The area is 540 square meters.



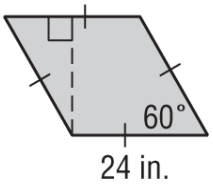
Exercises

Find the perimeter and area of each parallelogram. Round to the nearest tenth if necessary.

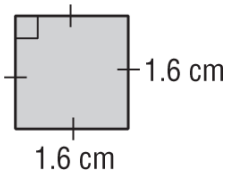
1.



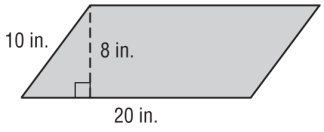
2.



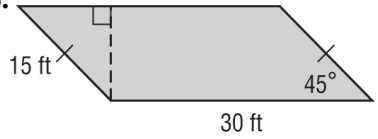
3.



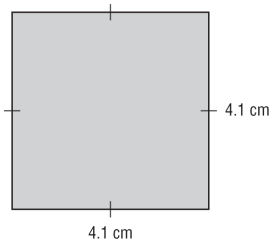
4.



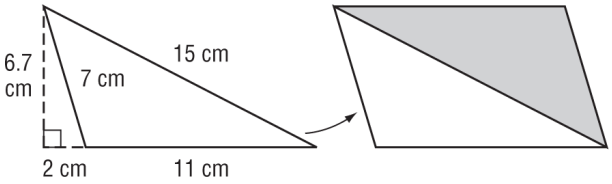
5.



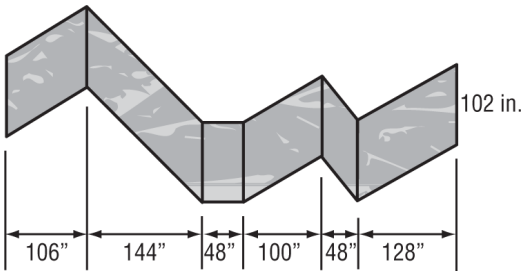
6.



7. TILE FLOOR A bathroom tile floor is made of black-and-white parallelograms. Each parallelogram is made of two triangles with dimensions as shown. Find the perimeter and area of one parallelogram.

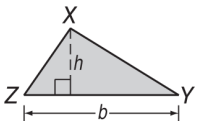


8. PATHS A concrete path shown below is made by joining several parallelograms. What is the total area of the path?



Areas Of Triangles The area of a triangle is one half the product of the base and its corresponding height. Like a parallelogram, the base can be any side, and the height is the length of an altitude drawn to a given base.

Area of a Triangle	If a triangle has an area of A square units, a base of b units, and a corresponding height of h units, then $A = \frac{1}{2}bh$.



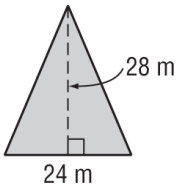
Example: Find the area of the triangle.

$A = \frac{1}{2}bh$ Area of a triangle

$= \frac{1}{2}(24)(28)$ $b = 24$, $h = 28$

$= 336$ Multiply.

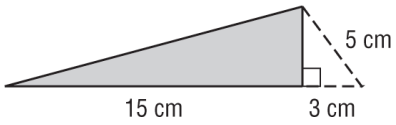
The area is 336 square meters.



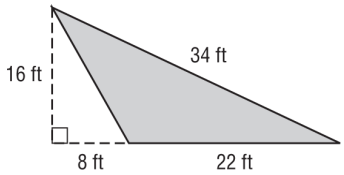
Exercises

Find the perimeter and area of each triangle. Round to the nearest tenth if necessary.

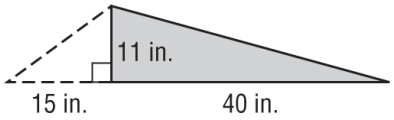
1.



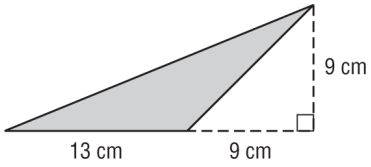
2.



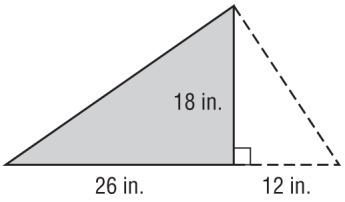
3.



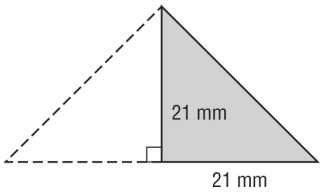
4.



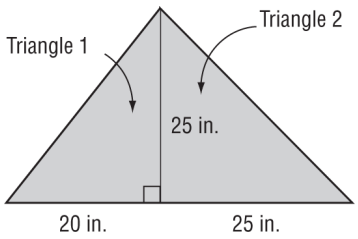
5.



6.

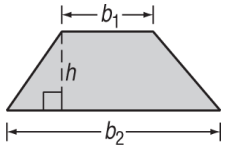


7. LOGO The logo for an engineering company is on a poster at a job fair. The logo consists of two triangles that have the dimensions shown. What are the perimeter and area of each triangle?



Areas of Trapezoids A trapezoid is a quadrilateral with exactly one pair of parallel sides, called bases. The **height of a trapezoid** is the perpendicular distance between the bases. The area of a trapezoid is the product of one half the height and the sum of the lengths of the bases.

Area of a Trapezoid	If a trapezoid has an area of A square units, bases of b_1 and b_2 units, and a height of h units, then $A = \frac{1}{2}h(b_1 + b_2)$

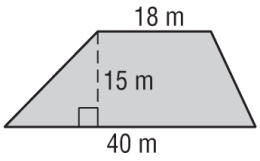


Example: Find the area of the trapezoid.

$A = \frac{1}{2}h(b_1 + b_2)$ Area of a trapezoid

$= \frac{1}{2}(15)(18 + 40)$ $h = 15$, $b_1 = 18$, and $b_2 = 40$

$= 435$ Simplify.

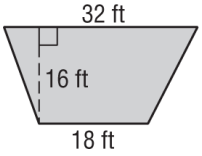


The area of the trapezoid is 435 square meters.

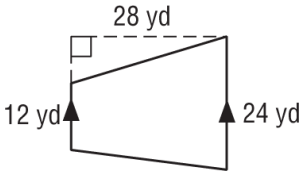
Exercises

Find the area of each trapezoid.

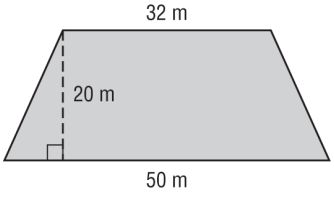
1.



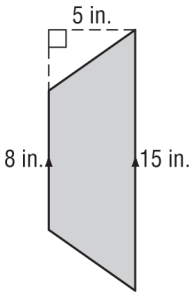
2.



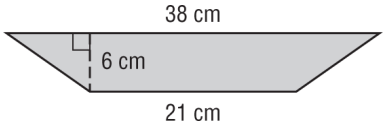
3.



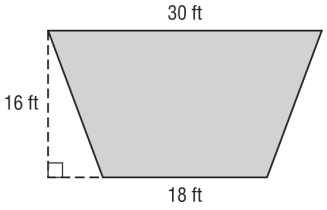
4.



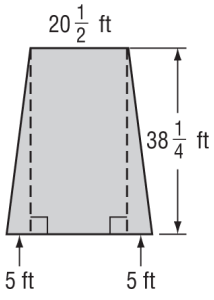
5.



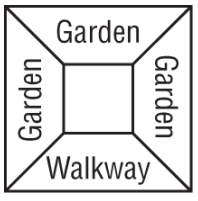
6.



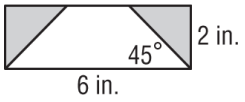
7. OPEN ENDED Ryan runs a landscaping business. A new customer has a trapezoidal shaped backyard, shown at the right. How many square feet of grass will Ryan have to mow?



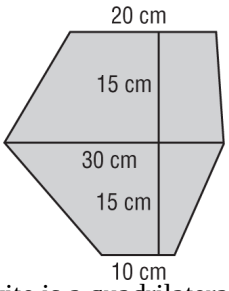
8. INTERIOR DESIGN The 20-by-20-foot square shows an office floor plan composed of three indoor gardens and one walkway, all congruent in shape. The gardens are centered around a 15-by-15 foot lounging area. What is the area of one of these gardens?



9. CUTOUTS A trapezoid is cut from a 6-inch-by-2-inch rectangle. The length of one base is 6 inches. What is the area of the trapezoid?

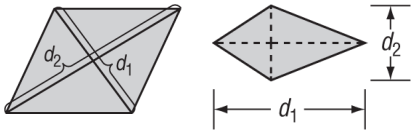


10. HEXAGONS Heather makes a hexagon by attaching two trapezoids together as shown. What is the area of the hexagon?

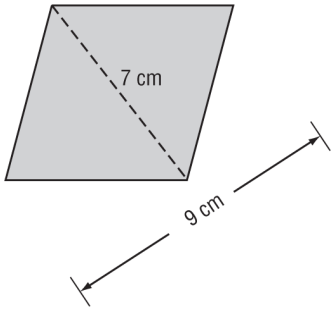


Areas of Rhombi and Kites A rhombus is a parallelogram with all four sides congruent. A kite is a quadrilateral with exactly two pairs of consecutive sides congruent.

Area of Rhombus or Kite	If a rhombus or kite has an area of A square units, and diagonals of d_1 and d_2 units, then $A = \frac{1}{2} d_1 \cdot d_2$.



Example: Find the area of the rhombus.



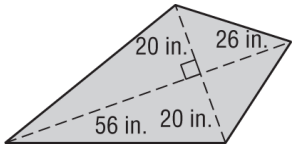
$A = \frac{1}{2} d_1 d_2$	Area of rhombus
$= \frac{1}{2}(7)(9)$	$d_1 = 7$, and $d_2 = 9$
$= 31.5$	Simplify.

The area is 31.5 square meters.

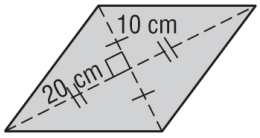
Exercises

Find the area of each rhombus or kite.

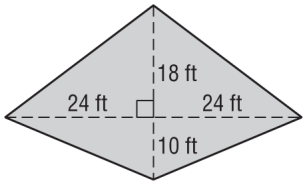
1.



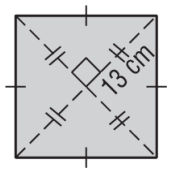
2.



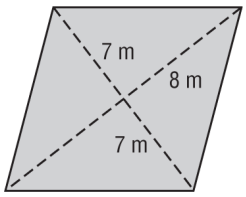
3.



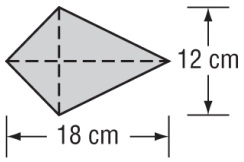
4.



5.

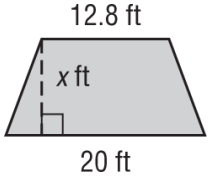


6.

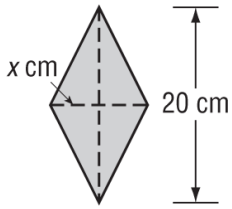


ALGEBRA Find *x*.

7. $A = 164$ ft^2



8. $A = 340$ cm^2



9. $A = 247.5$ mm^2