

Name:

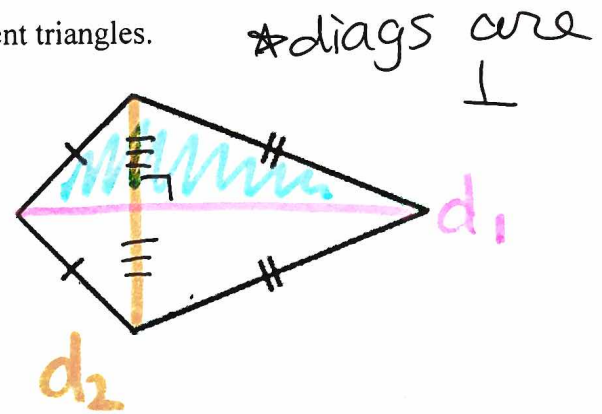
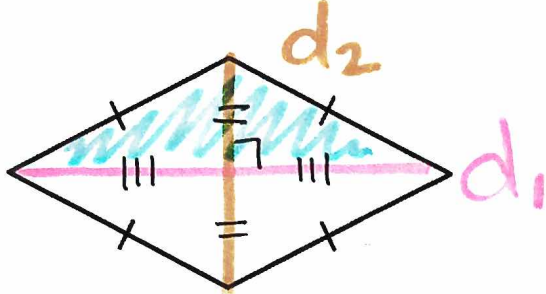
Date:

Period:

Areas of Quadrilaterals

Learning Objective INBAT derive and apply area formulas for rhombus, kite, ~~parallelogram~~, trapezoid.

You can divide a rhombus or kite with diagonals d_1 and d_2 into two congruent triangles.



The area of one of those triangles is:

$$A = \frac{1}{2}bh = \frac{1}{2}(d_1)\left(\frac{1}{2}d_2\right) = \frac{1}{4}d_1d_2$$

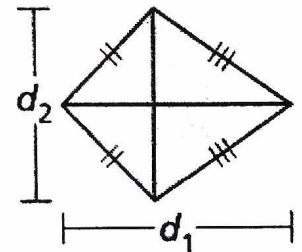
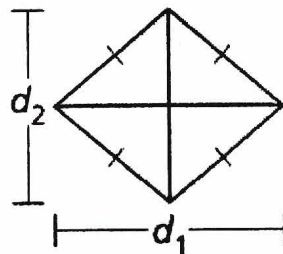
Thus, the area of the rhombus or kite is:

$$2\left(\frac{1}{4}d_1d_2\right) = \frac{1}{2}d_1d_2$$

Area of a Rhombus or Kite

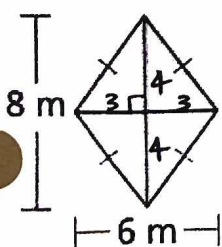
The area of a rhombus or kite with diagonals d_1 and d_2 is:

$$\frac{1}{2}d_1d_2$$



Examples:

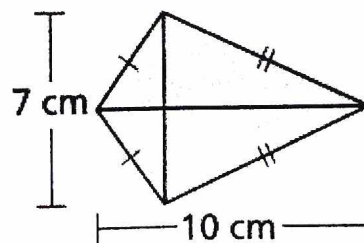
1. Find the area of the rhombus.



$$\frac{1}{2}(8)(6)$$

$$24 \text{ m}^2$$

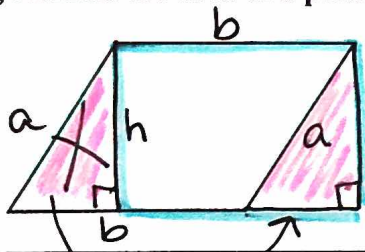
2. Find the area of the kite.



$$\frac{1}{2}(7)(10)$$

$$35 \text{ cm}^2$$

Deriving formula for area of a parallelogram:



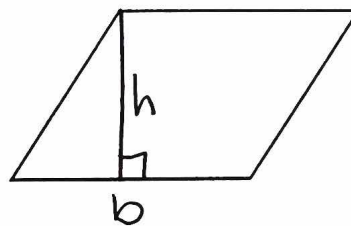
*becomes a rectangle!

$$A = bh$$

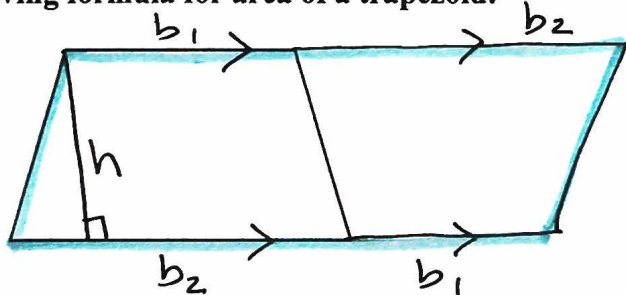
Area of a Parallelogram

The area of a parallelogram with base b and height h is:

$$A = bh \quad \star b \perp h$$



Deriving formula for area of a trapezoid:



① take a 2nd trap. + place it next to 1st

② becomes a ll-gram

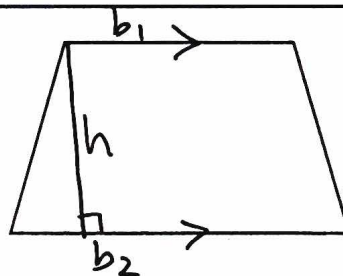
$$A = (b_1 + b_2)(h)$$

③ $\div$ by 2 to get area of 1 trap. $A = \frac{1}{2}(b_1 + b_2)(h)$

Area of a Trapezoid

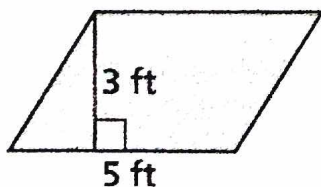
The area of a trapezoid with bases b_1 and b_2 is:

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



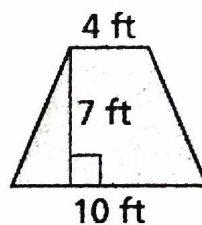
Examples:

3. Find the area of the parallelogram.



$$A = (3)(5) \\ = \boxed{15 \text{ ft}^2}$$

4. Find the area of the trapezoid.



$$A = \frac{1}{2}(4 + 10)(7) \\ = \frac{1}{2}(14)(7) \\ = \boxed{49 \text{ ft}^2}$$