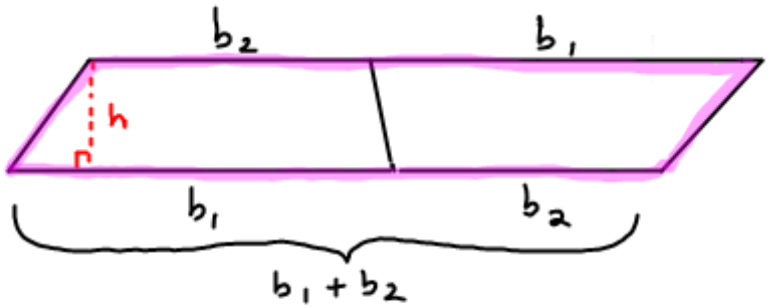
11.3 & 11.4 Honors Geometry

DATE: 5/16

Draw a sketch of a trapezoid. Then label the bases, b_1 and b_2, and height, h, in your diagram.

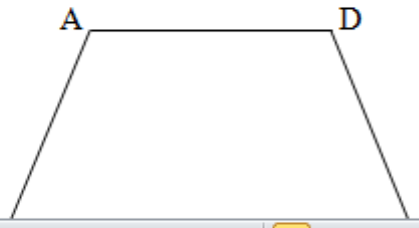


$A_{\parallel\text{-gram}} = b \cdot h$

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

Area of Trapezoid = $\frac{1}{2}h(b_1 + b_2)$ units^2

The median of trapezoid is a line segment joining the midpoints of the non-parallel sides.



Area of Trapezoid = _____

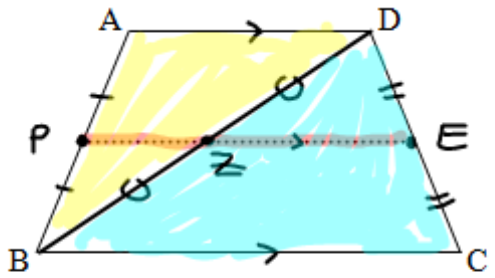
The median of trapezoid is a line segment joining the midpoints of the non-parallel sides.

$\frac{1}{2}\overline{AD} = \overline{PZ}$

$\frac{1}{2}\overline{BC} = \overline{ZE}$

$M = \overline{PE} = \overline{PZ} + \overline{ZE}$

$= \frac{1}{2}\overline{AD} + \frac{1}{2}\overline{BC}$



Median of Trapezoid = $\frac{1}{2}(b_1 + b_2)$

Draw a sketch of a kite. Then label it ABCD.

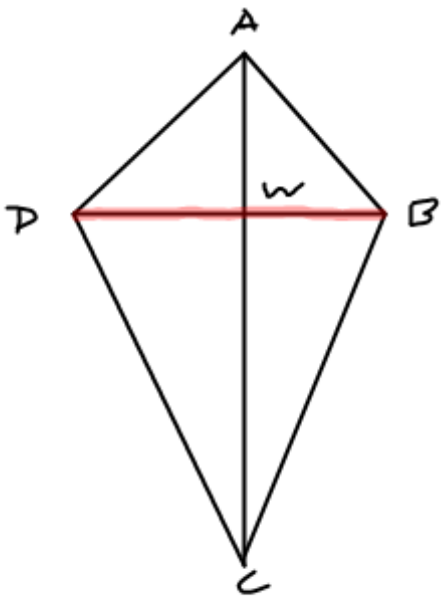
Median of Trapezoid = _____

Draw a sketch of a kite. Then label it ABCD.

$\frac{1}{2}\overline{DB}\,\overline{AW} + \frac{1}{2}\overline{DB}\,\overline{CW}$

$\frac{1}{2}\overline{DB}(\overline{AW} + \overline{CW})$

$\frac{1}{2} d_1 \cdot d_2$



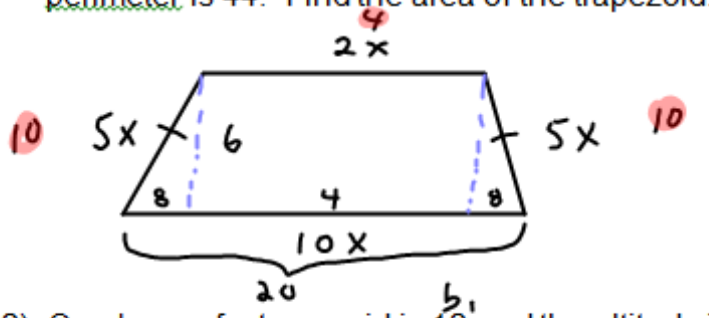
Area of a Kite = $\frac{1}{2} d_1 \cdot d_2$

Examples

1) The consecutive sides of an isosceles trapezoid are in the ratio of 2:5:10:5, and the trapezoid's

Examples

1) The consecutive sides of an isosceles trapezoid are in the ratio of 2:5:10:5, and the trapezoid's perimeter is 44. Find the area of the trapezoid.



$P = 44$

$\frac{22x}{22} = \frac{44}{22}$

$x = 2$

$A = \frac{1}{2}(6)(20+4)$

$= 3(24)$

$= 72\ u^2$

2) One base of a trapezoid is 12 and the altitude is 16. If the area is 248, find the length of the other base.

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

$248 = \frac{1}{2}(16)(12 + b_2)$

$\frac{248}{8} = \frac{8 \cdot (12 + b_2)}{8}$

$31 = 12 + b_2$

$-12 \quad -12$

$19 = b_2$

3) Find the area of the isosceles trapezoid on the right.

30	60	90
↓	↓	↓
x	$x\sqrt{3}$	2x
3	$3\sqrt{3}$	6

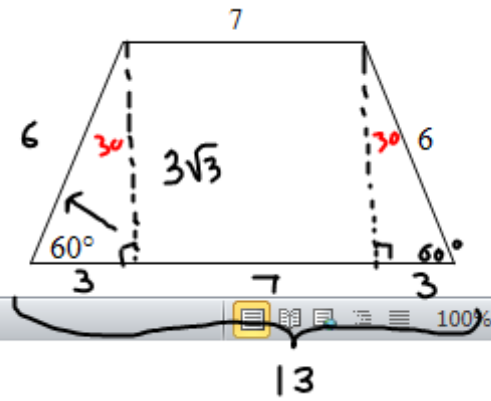
$2x = 6$

$x = 3$

$A = \frac{1}{2} 3\sqrt{3}(7 + 13)$

$= \frac{1}{2} 3\sqrt{3} \cdot 20$

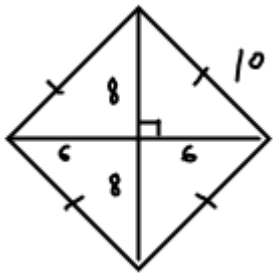
$= 30\sqrt{3}\ u^2$



4) Find the area of the rhombus whose perimeter is 40 and whose longer diagonal is 16.

$\frac{40}{4} = 10$

Rh $\Rightarrow$ all sides $\cong$



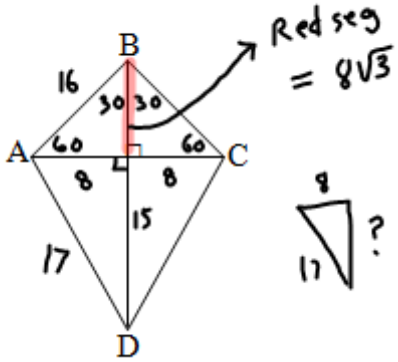
$d_1 = 16$

$d_2 = 12$

$A = \frac{1}{2}(16)(12)$

$= 8 \cdot 12 = 96\ u^2$

5) Given m∠ABC = 60°, AD = 17, AB = 16. Find the area of kite ABCD.



(8, 15, 17)

$A = \frac{1}{2}(AC)(BD) = \frac{1}{2}(8+8)(8\sqrt{3}+15)$

$= \frac{1}{2}(16)(8\sqrt{3}+15)$

$= 8(8\sqrt{3}+15) = 64\sqrt{3}+120\ u^2$