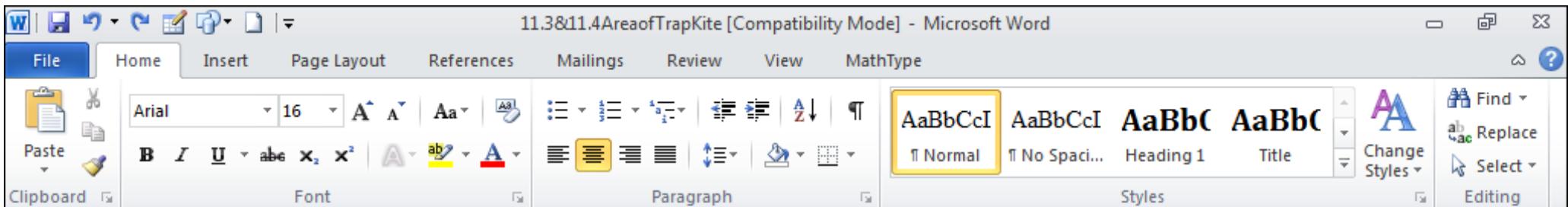


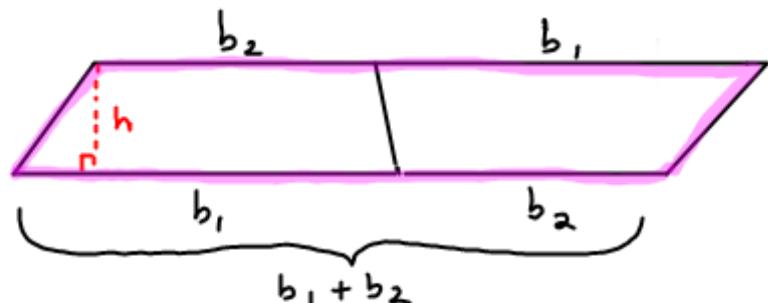
11.3&11.4AreaofTrapKite [Compatibility Mode] - Microsoft Word



## **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.

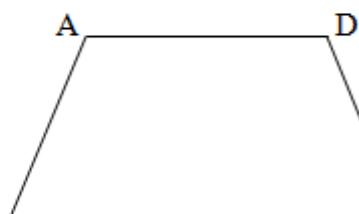


$$A_{\text{gram}} = b \cdot h$$

$$\frac{1}{2}(\mathbf{b}_1 + \mathbf{b}_2) \cdot \mathbf{h}$$

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

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.

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**Median of Trapezoid =** \_\_\_\_\_

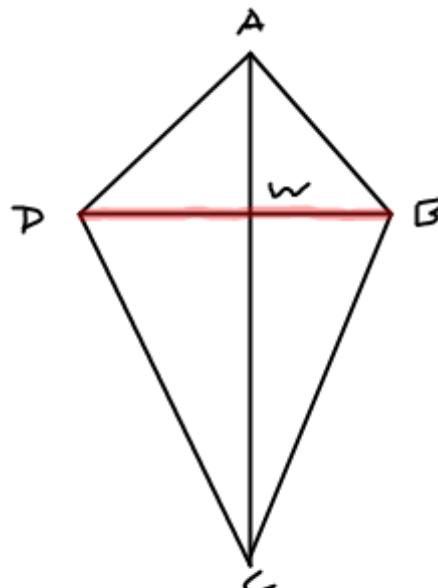
Draw a sketch of a kite. Then label it ABCD.

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

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

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

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



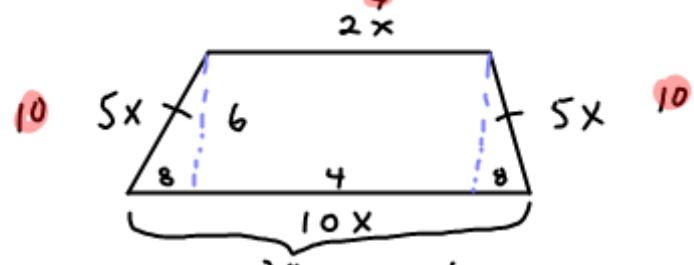
### Examples

- 1) The consecutive sides of an isosceles trapezoid are in the ratio of 7:5:10:5 and the trapezoid's

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## 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.



$$P = 44$$

$$\frac{2}{2} \cdot 2x = \frac{44}{2}$$

$$x = 2$$

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

$$= 3(24)$$

$$= 72 \text{ u}^2$$

- 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.

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

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

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

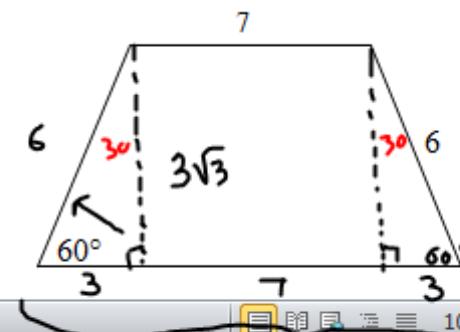
$$19 = b_2$$

$$\frac{31}{12} = \frac{12 + b_2}{12}$$

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

$$\begin{array}{c} 30 & 60 & 90 \\ \downarrow & \downarrow & \downarrow \\ x & x\sqrt{3} & 2x \\ 3 & 3\sqrt{3} & 6 \\ 2x = 6 & & \\ x = 3 & & \end{array}$$

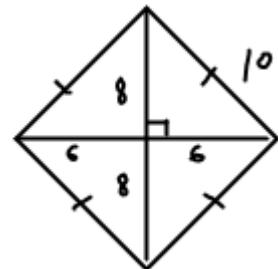
$$\begin{aligned} A &= \frac{1}{2} 3\sqrt{3} (7 + 13) \\ &= \frac{1}{2} 3\sqrt{3} \cdot 20 \\ &= 30\sqrt{3} \text{ u}^2 \end{aligned}$$



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



$$\text{Rh} \Rightarrow \text{all sides} \cong \frac{40}{4} = 10$$

$$d_1 = 16$$

$$d_2 = 12$$

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

$$= 8 \cdot 12 = 96 \text{ u}^2$$

- 5) Given  $m\angle ABC = 60^\circ$ ,  $AD = 17$ ,  $AB = 16$ . Find the area of kite ABCD.

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

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

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

