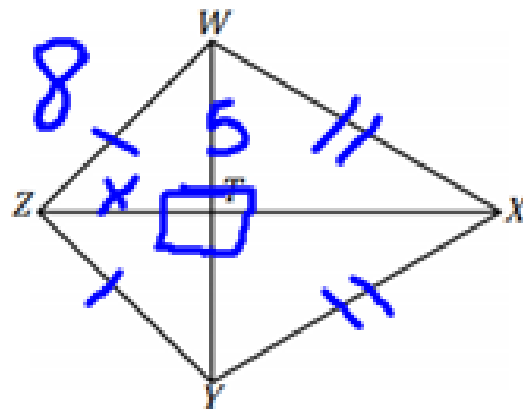Consider kite WXYZ.
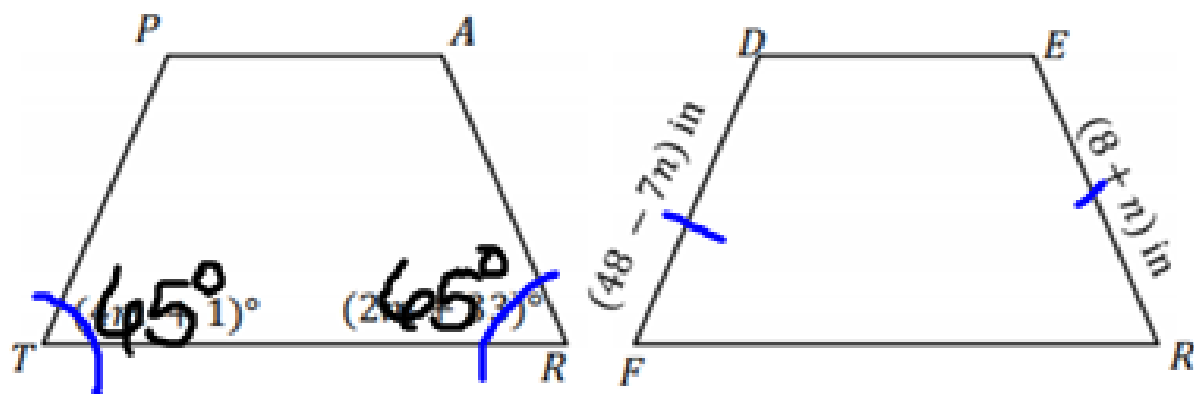


a. If $m\angle WZT = 55°$ and $m\angle WXY = 30°$, find $m\angle ZWX$.

b. If $WZ = 8$ and $WT = 5$, find $ZT$.

$$a^2 + b^2 = c^2$$
$$5^2 + x^2 = 8^2$$
$$25 + x^2 = 64$$
$$\sqrt{x^2} = \sqrt{39}$$

$\boxed{\sqrt{39}}$

4. Consider isosceles trapezoids *TRAP* and *FRED*.



Find *m, n, m∠PTR, m∠PAR,* and *FD*.

$$4m+1 = 2m+33$$
$$-2m \quad -2m$$
$$2m+1 = 33$$
$$-1 \quad -1$$
$$2m = 32$$
$$m = 16$$

$$48-7n = 8+n$$
$$+7n \quad +7n$$
$$48 = 8+8n$$
$$-8 \quad -8$$
$$40 = 8n$$
$$5 = n$$

$$m\angle PTR = 4(16)+1 = 65°$$

$$m\angle PAR = 115°$$

$$FD = 48-7(5) = 13$$

$y = \boxed{m}x + b$
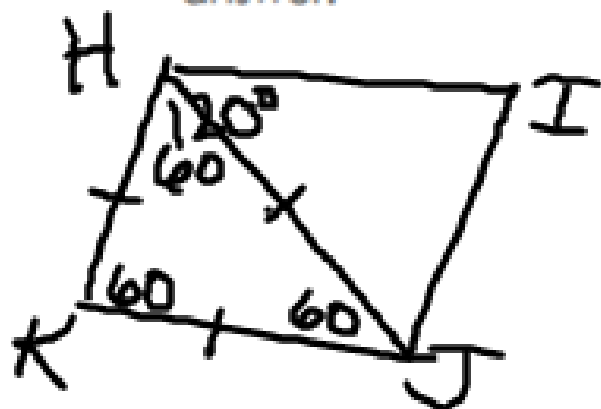
1. A diagonal of a rhombus that is on the coordinate plane can be modeled by the equation $6x + y = 13$. What is the slope of the other diagonal?

$$6x + y = 13$$
$$-6x \qquad -6x$$
$$\overline{\qquad\qquad\qquad}$$
$$y = -6x + 13$$

$$m = \boxed{\frac{1}{6}}$$

2. In rhombus $HIJK$, $m\angle H$ is $120°$. Does the diagonal $\overline{HJ}$ divide the rhombus into two equilateral triangles? Justify your answer.
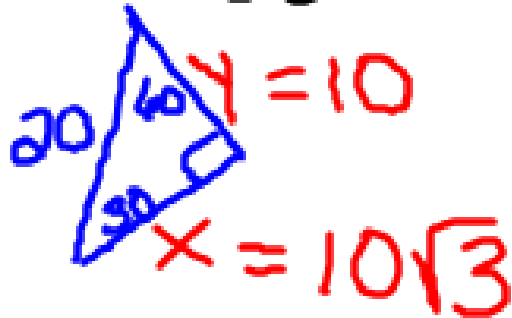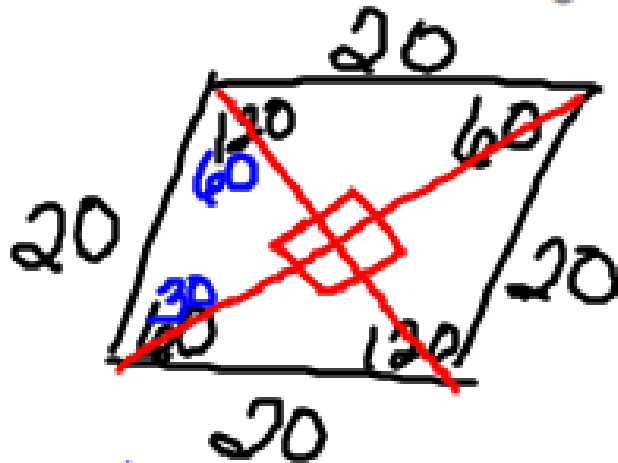
yes

Diagonals bisect opp $\angle$'s

$120 \div 2 = 60$

$180 \div 3 = 60$

H  120°  I
60
60    60
K    60   J

3. The size of the acute angle of a rhombus is half the size of its obtuse angle. The side length of the rhombus is equal to 20 feet. Find the lengths of the diagonals of the rhombus.
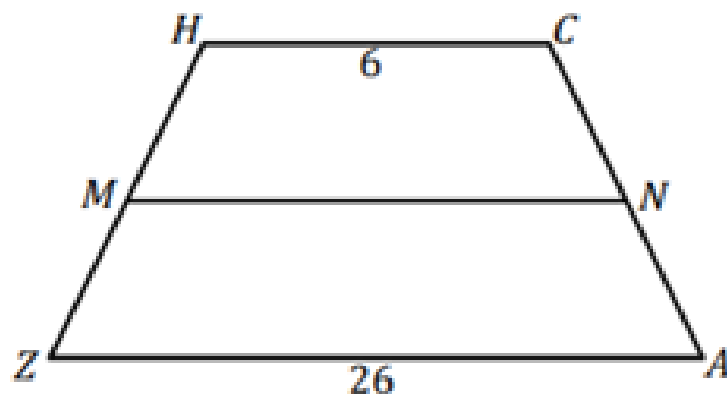
$20, 20\sqrt{3}$

$Y = 10$

$X = 10\sqrt{3}$

# The midsegment Theorem

The **midsegment** of a **trapezoid** is **parallel** to each **base** and its length is **half** the **sum** of the lengths of the **bases**

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

$b_1$

midsegment →

$b_2$
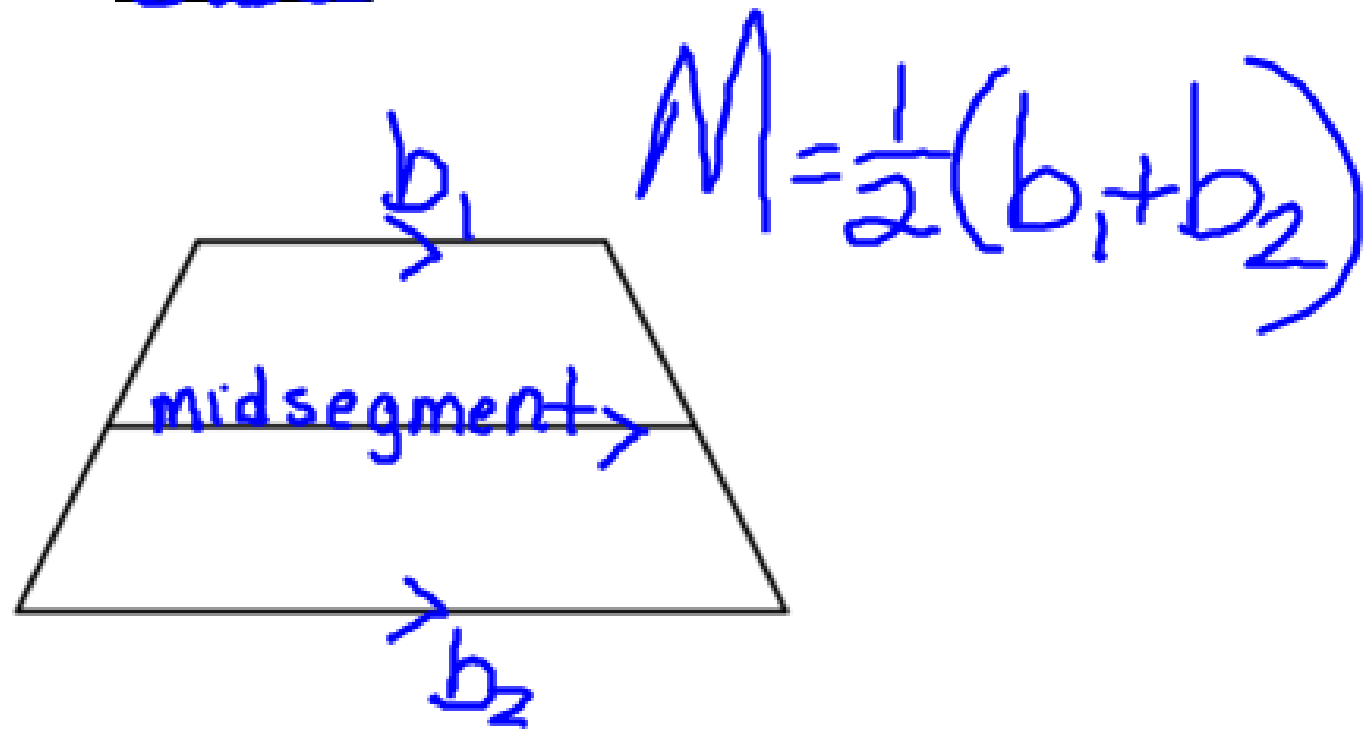
ZACH is an isosceles trapezoid with midsegment $\overline{MN}$.



Determine the length of $\overline{MN}$.

$$\frac{6+26}{2} = \boxed{16}$$