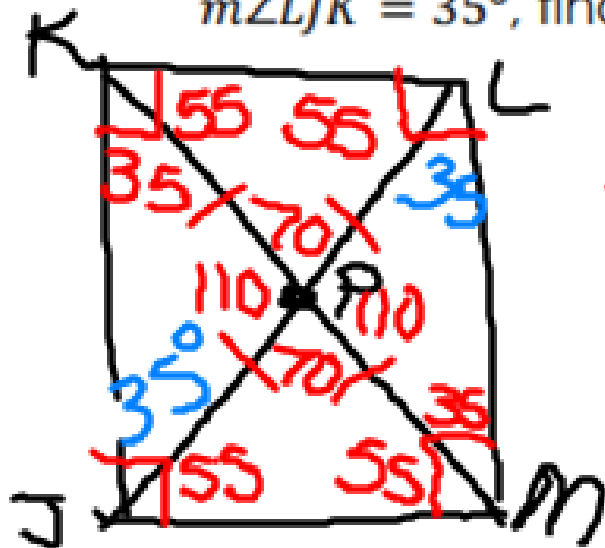


The lengths of diagonals of a rectangle are represented by  $5x$  yards and  $7x - 18$  yards. Find the length of each diagonal.

$$\begin{array}{r}
 5x = 7x - 18 \\
 - 7x \quad - 7x \\
 \hline
 - 2x = -18 \\
 x = 9
 \end{array}$$

$$\begin{array}{l}
 5(9) = 45 \\
 7(9) - 18 = 45
 \end{array}$$

Rectangle JKLM has diagonals intersecting at  $P$ . If  $m\angle LJK = 35^\circ$ , find  $m\angle LJM$ ,  $m\angle JLK$ ,  $m\angle JPK$ , and  $m\angle JPM$ .



$$\begin{array}{r}
 35 \quad 180 \\
 35 - 70 \\
 \hline
 70 \quad 110
 \end{array}$$

$$\begin{array}{l}
 m\angle LJM = 55^\circ \\
 m\angle JLK = 55^\circ \\
 m\angle JPK = 110^\circ \\
 m\angle JPM = 70^\circ
 \end{array}$$

In square ABCD, the diagonals intersect at  $G$ . If  $AC = 9x - 6$  and  $BD = 21x - 30$ .

$$9x - 6 = 21x - 30$$

$$AC = 12$$

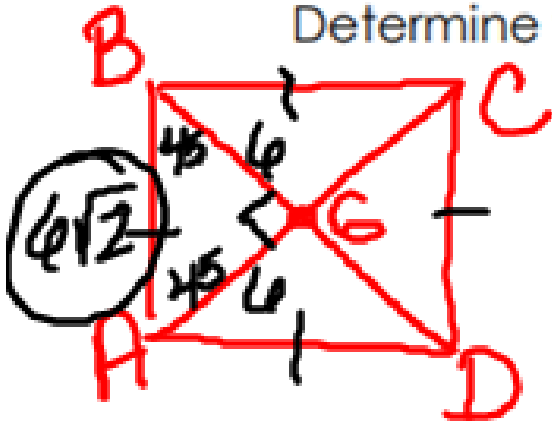
$$BD = 12$$

Determine the length of the side of the square.

$$-6 = 12x - 30$$

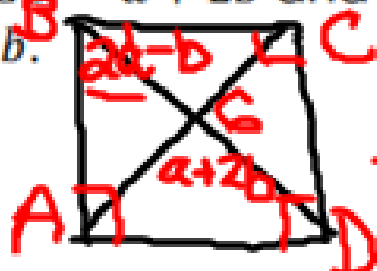
$$24 = 12x$$

$$2 = x$$



In square ABCD, the diagonals intersect at  $G$ .

If  $m\angle AGD = a + 2b$  and  $m\angle ABC = 2a - b$ , find the values of  $a$  and  $b$ .



$$2a - b = 90$$

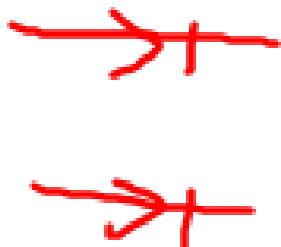
$$2(a + 2b = 90) \Rightarrow 2a + 4b = 180$$

$$\begin{array}{r} 2a - b = 90 \\ 2a + 4b = 180 \\ \hline -5b = -90 \\ b = 18 \end{array}$$

$$\begin{array}{r} 2a - 18 = 90 \\ +18 \quad +18 \\ \hline 2a = 108 \\ a = 54 \end{array}$$

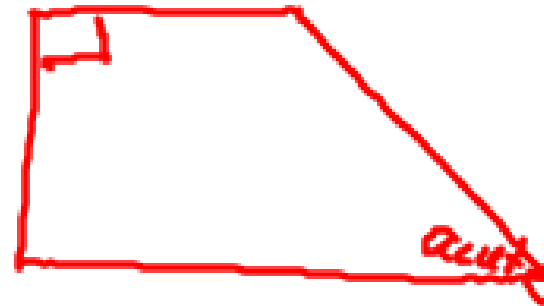
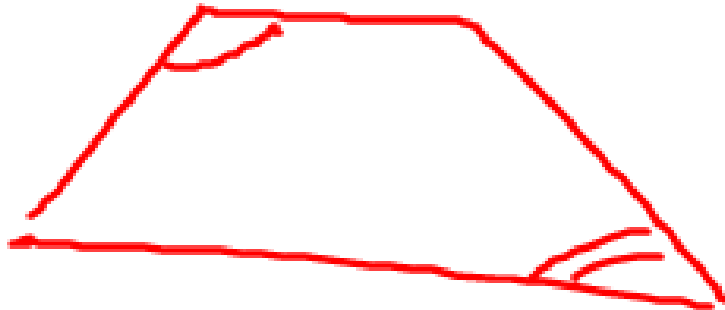
1. Identify which quadrilateral(s) meet the following criteria.

Criteria	Trapezoid	Parallelogram	Kite	Rhombus	Rectangle	Square
No parallel sides	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exactly one pair of parallel sides	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exactly one pair of sides are both congruent and parallel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Two pairs of opposite sides are congruent	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Two pairs of opposite angles are congruent	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Consecutive angles are supplementary	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Diagonals bisect the vertex angles	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

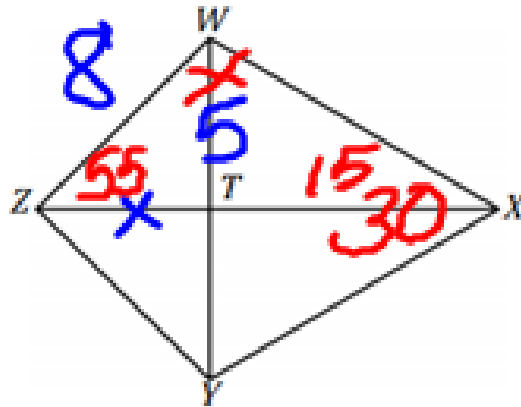


1. If two opposite angles of a quadrilateral are supplementary, is the quadrilateral a parallelogram?

- (A) No, because in parallelograms, angles are supplementary if and only if they are consecutive.
- (B) No, because opposite angles in a parallelogram are never congruent.
- (C) Yes, but only when the angles of the quadrilateral are right angles. Otherwise, it will be a trapezoid rather than a parallelogram.
- (D) Yes, because only squares have that property, and squares are both parallelograms and quadrilaterals.



Consider kite  $WXYZ$ .



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

$$55 + 15 + x = 180$$
$$x = 110^\circ$$

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

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

$$\sqrt{39}$$

