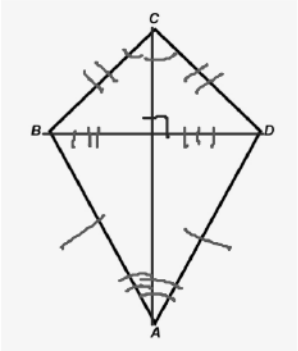
Kite - Quadrilateral with 2 pairs of consectutive sides congruent but opposite sides are not congruent.

$\angle A \cong \angle C$ Vertex Angles



$\angle B \cong \angle D$ Non-Vertex Angles

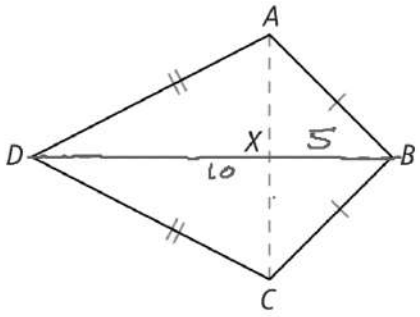
Properties of a Kite

- Diagonals are perpendicular. Exactly one diagonal bisects the other.
- Exactly one pair of opposite angles are congruent
  - ↳ Non-Vertex Angles $\cong$.

1. a. What is the measure of $\angle AXB$? $= 90^{\circ}$

Enter your answer.

CHECK ANSWER



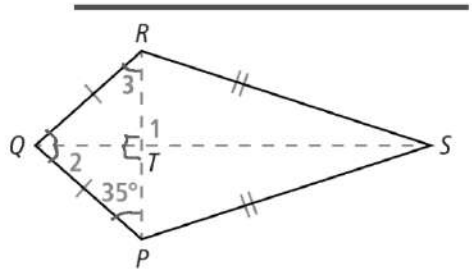
b. If $AX = 3.8$, what is AC? $= 7.6$

Enter your answer.

c. If $BD = 10$, does $BX = 5$? Explain.

Enter your answer.

Quadrilateral *PQRS* is a kite with diagonals $\overline{QS}$ and $\overline{PR}$.



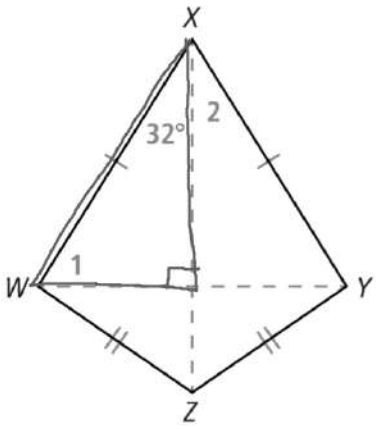
A. What is $m\angle 1$? $= 90^\circ$

SOLUTION

B. What is $m\angle 2$? $= 55^\circ$

C. What is $m\angle 3$? $= 35^\circ$

2. Quadrilateral *WXYZ* is a kite.



a. What is $m\angle 1$? $= 58^\circ$

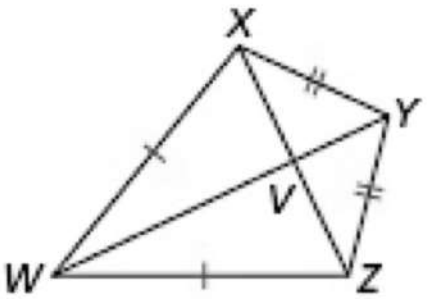
Enter your answer.

CHECK ANSWER

b. What is $m\angle 2$? $= 32^\circ$

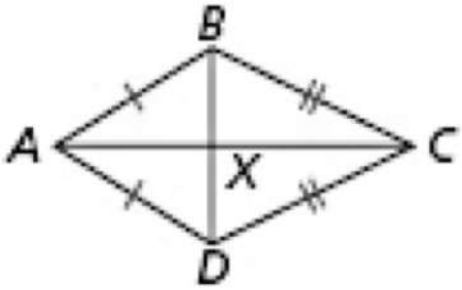
In kite WXYZ, m∠WXY = 104°, and m∠VYZ = 49°. Find each measure.

1. m∠VZY = _____
2. m∠VXW = _____
3. m∠XWZ = _____

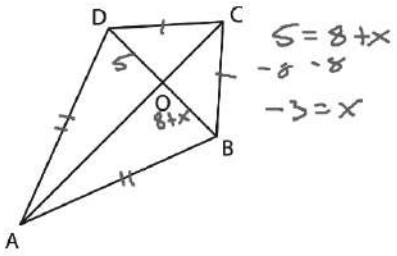


In kite ABCD, m∠DAX = 32°, and m∠XDC = 64°. Find each measure.

4. m∠XDA = _____
5. m∠ABC = _____
6. m∠BCD = _____



Find the value of x.



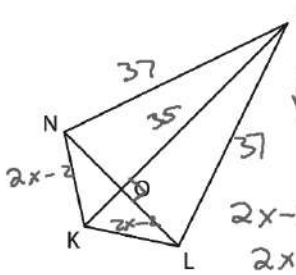
$5 = 8 + x$

$-8 \quad -8$

$-3 = x$

OB = $(8 + x)$ in ; OD = 5 in

$x =$ _____



$35^2 + (2x-2)^2 = 37^2$

$1225 + (2x-2)^2 = 1369$

$\sqrt{(2x-2)^2} = \sqrt{144}$

$2x - 2 = \pm 12$

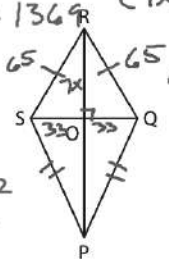
$2x - 2 = 12$ $\qquad$ $2x - 2 = -12$

$2x = 14$ $\qquad$ $2x = -10$

$x = 7$ $\qquad$ $x = -5$

OL = $(2x - 2)$ ft ; OM = 35 ft; MN = 37 ft

$x =$ _____



$(7x)^2 + 33^2 = 65^2$

$49x^2 + 1089 = 4$

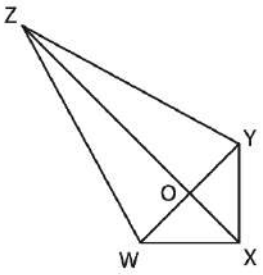
$\frac{49x^2}{49} =$

$x^2 =$

x

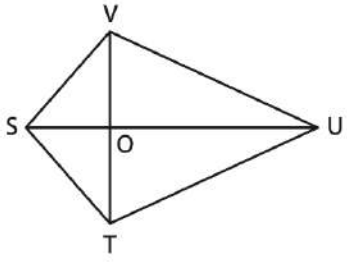
OQ = 33 yd ; RS = 65 yd ; OR = $(7x)$ yd

$x =$ _____



OY = 7 in ; WZ = $(4x + 5)$ in ; OZ = 24 in

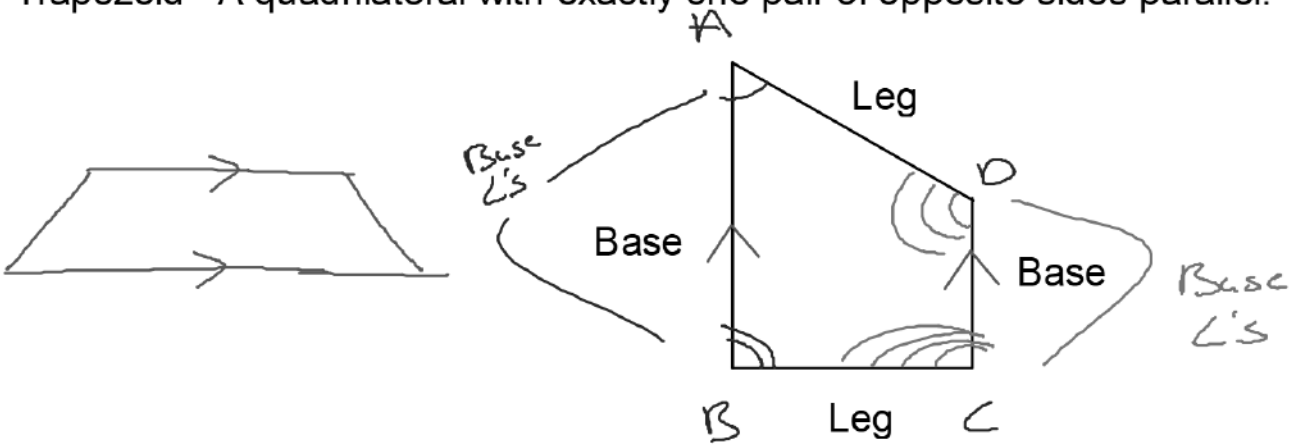
$x =$ _____



VT = 8 yd ; OV = $(-2 - 3x)$ yd

$x =$ _____

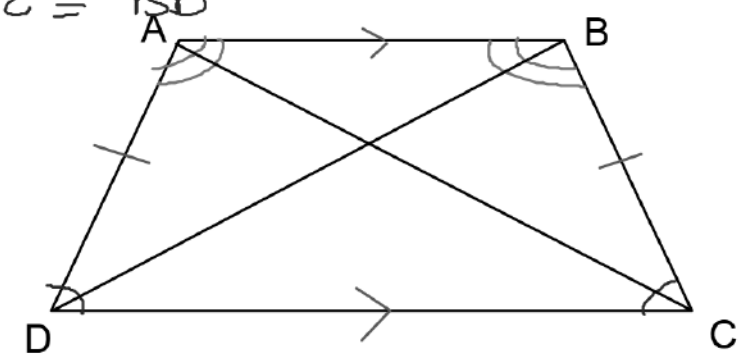
Trapezoid - A quadrilateral with exactly one pair of opposite sides parallel.



- The bases are the parallel sides
- Legs are the non parallel sides
- 2 pairs of base angles

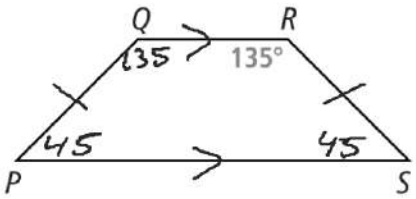
Isosceles Trapezoid

- Legs are congruent
- Both pairs of base angles are congruent $\angle A \cong \angle B$ $\angle C \cong \angle D$
- Diagonals are congruent $\overline{AC} \cong \overline{BD}$



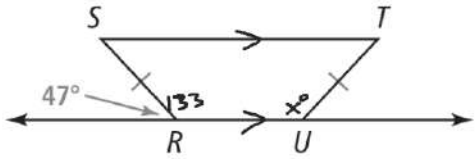
3. a. Given isosceles trapezoid *PQRS*, what are $m\angle P$, $m\angle Q$, and $m\angle S$?

Enter your answer.



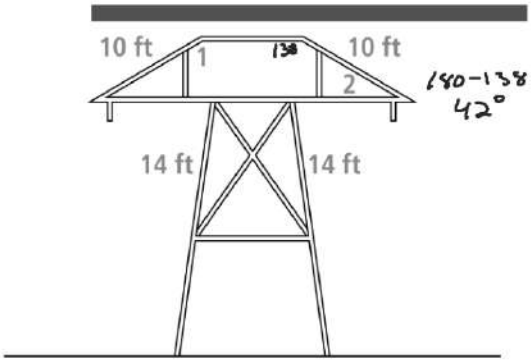
3. b. Given $\overline{ST} \parallel \overline{RU}$, what is the measure of $\angle TUR$? = 133°

Enter your answer.



180−47

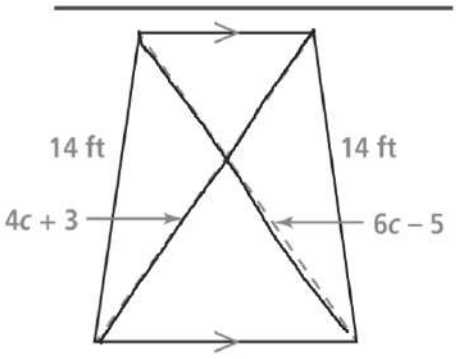
All horizontal beams of the high-voltage transmission tower are parallel to the ground. The top section is an isosceles trapezoid. The center section is an isosceles trapezoid.



A. If $m\angle 1 = 138$, what is $m\angle 2$?

SOLUTION

B. One cross support in the center of the tower measures $4c + 3$, and the other measures $6c - 5$. What is the length of each cross support? $= 19$ ft



SOLUTION

$4c + 3 = 6c - 5$

$3 = 2c - 5$

$8 = 2c$

$c = 4$

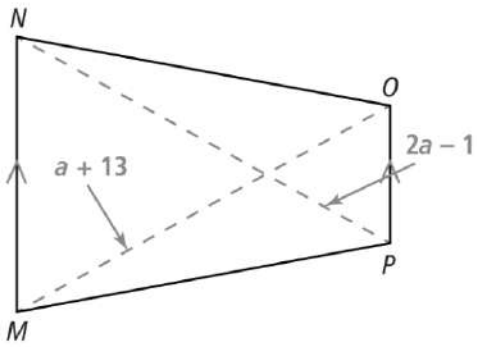
4. Given isosceles trapezoid *MNOP* where the given expressions represent the measures of the diagonals, what is the value of *a*?

Enter your answer

$2a - 1 = a + 13$

$a - 1 = 13$

$a = 14$



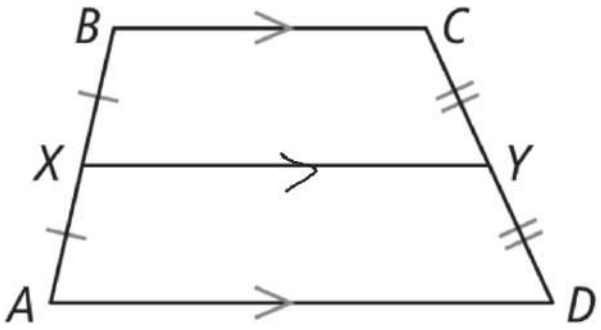
Midsegment of a Trapeziod

In a trapezoid, the segment containing the midpoints of the two legs is parallel to the bases, and its length is half the sum of the lengths of the bases.

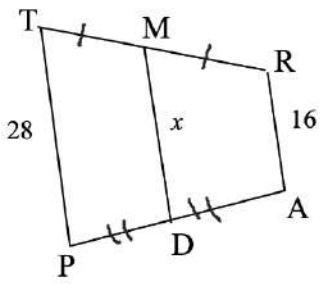
Average

$\overline{XY} \parallel \overline{AD}$, $\overline{XY} \parallel \overline{BC}$,

and $XY = \frac{1}{2}(AD + BC)$



MD= 22

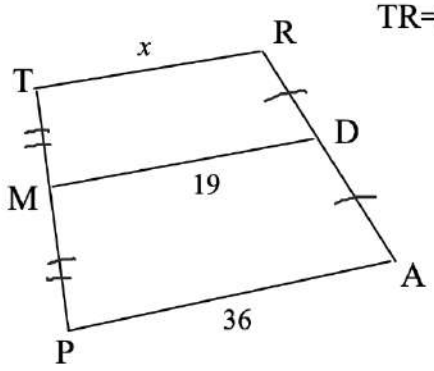


$X = \frac{1}{2}(16+28)$

$= \frac{1}{2}(44)$

$= 22$

TR=_____

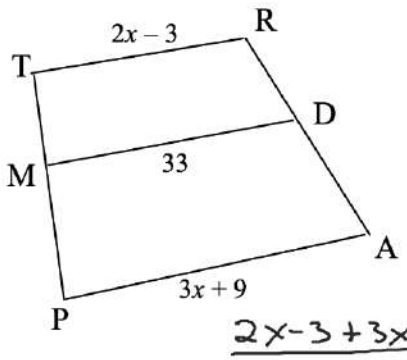


$\frac{1}{2}(x+36)$

$2\left(\frac{x+36}{2}\right) = (19)2$

$x+36 = 38$

$x = 2$



$x=$ 12

TR= 21

PA= 45

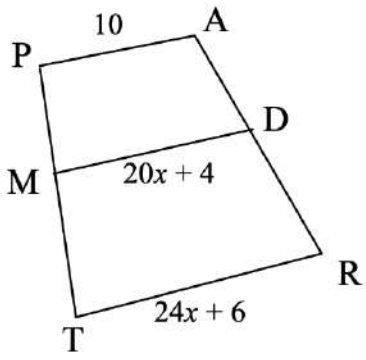
$$\frac{2x-3+3x+9}{2} = 33$$

$$2\left(\frac{5x+6}{2}\right)=(33)2$$

$$5x+6=66$$

$$5x=60$$

$$x=12$$



$x=$ $\frac{1}{2}$

TR= 18

MD= 14

$$\frac{10+24x+6}{2} = 20x+4$$

$$\frac{24x+16}{2} = 20x+4$$

$$12x+8 = 20x+4$$

$$8 = 8x+4$$

$$4 = 8x$$

$$x = \frac{1}{2}$$

$24x+16=40x+8$