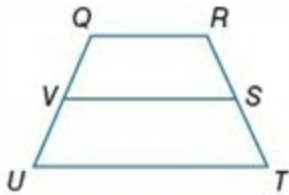


## 6-6 Trapezoids and Kites

For trapezoid  $QRTU$ ,  $V$  and  $S$  are midpoints of the legs.



16. If  $QR = 12$  and  $UT = 22$ , find  $VS$ .

**SOLUTION:**

By the Trapezoid Midsegment Theorem, the midsegment of a trapezoid is parallel to each base and its measure is one half the sum of the lengths of the bases.

$\overline{QR}$  and  $\overline{UT}$  are the bases and  $\overline{VS}$  is the midsegment. So,

$$VS = \frac{QR + UT}{2}$$

$$VS = \frac{12 + 22}{2}$$

$$= 17$$

**ANSWER:**

17

18. If  $VS = 9$  and  $UT = 12$ , find  $QR$ .

**SOLUTION:**

By the Trapezoid Midsegment Theorem, the midsegment of a trapezoid is parallel to each base and its measure is one half the sum of the lengths of the bases.

$\overline{QR}$  and  $\overline{UT}$  are the bases and  $\overline{VS}$  is the midsegment. So,

$$VS = \frac{QR + UT}{2}$$

$$9 = \frac{QR + 12}{2}$$

$$18 = QR + 12$$

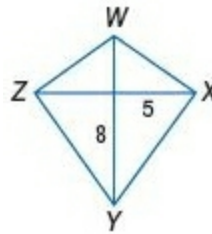
$$6 = QR$$

**ANSWER:**

6

**SENSE-MAKING** If  $WXYZ$  is a kite, find each measure.

24.  $YZ$



**SOLUTION:**

By the Pythagorean Theorem,

$$XY^2 = 8^2 + 5^2 = 89$$

$$XY = \sqrt{89}$$

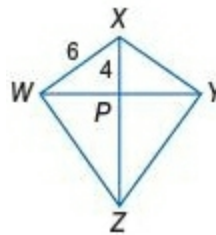
A kite is a quadrilateral with exactly two pairs of consecutive congruent sides. So,  $\overline{XY} \cong \overline{ZY}$ .

Therefore,  $YZ = XY = \sqrt{89}$ .

**ANSWER:**

$$\sqrt{89}$$

25.  $WP$



**SOLUTION:**

By the Pythagorean Theorem,

$$WP^2 = WX^2 - XP^2 = 6^2 - 4^2 = 20$$

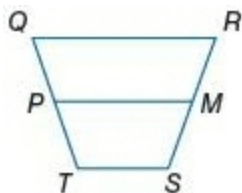
$$WP = \sqrt{20}$$

**ANSWER:**

$$\sqrt{20}$$

## 6-6 Trapezoids and Kites

**ALGEBRA** For trapezoid  $QRST$ ,  $M$  and  $P$  are midpoints of the legs.



42. If  $TS = 2x$ ,  $PM = 20$ , and  $QR = 6x$ , find  $x$ .

**SOLUTION:**

By the Trapezoid Midsegment Theorem, the midsegment of a trapezoid is parallel to each base and its measure is one half the sum of the lengths of the bases.

$\overline{QR}$  and  $\overline{TS}$  are the bases and  $\overline{PM}$  is the midsegment. So,

$$PM = \frac{QR + TS}{2}$$

$$20 = \frac{6x + 2x}{2}$$

Solve for  $x$ .

$$40 = 8x$$

$$5 = x$$

**ANSWER:**

5

44. If  $TS = 2x + 2$ ,  $QR = 5x + 3$ , and  $PM = 13$ , find  $TS$ .

**SOLUTION:**

By the Trapezoid Midsegment Theorem, the midsegment of a trapezoid is parallel to each base and its measure is one half the sum of the lengths of the bases.

$\overline{QR}$  and  $\overline{TS}$  are the bases and  $\overline{PM}$  is the midsegment. So,

$$PM = \frac{QR + TS}{2}$$

$$13 = \frac{5x + 3 + 2x + 2}{2}$$

Solve for  $x$ .

$$26 = 7x + 5$$

$$21 = 7x$$

$$3 = x$$

Substitute.

$$TS = 2(3) + 2 = 8$$

**ANSWER:**

8