

MIDSEGMENT of a TRAPEZOID

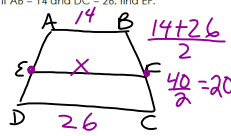
The midsegment of a trapezoid connects the midpoints of the legs:

If \overline{EF} is the midsegment of trapezoid $ABCD$, then:

- \overline{EF} is \parallel to \overline{AB} and \overline{DC}
- $\overline{EF} = \frac{AB+DC}{2}$

Practical Use the trapezoid above for questions 1-4.

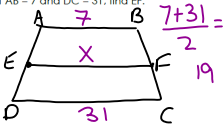
1) If $AB = 14$ and $DC = 26$, find EF .



$$\frac{14+26}{2} = x$$

$$\frac{40}{2} = 20$$

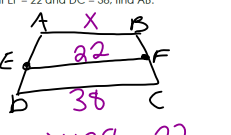
2) If $AB = 7$ and $DC = 31$, find EF .



$$\frac{7+31}{2} = x$$

$$\frac{38}{2} = 19$$

3) If $EF = 22$ and $DC = 38$, find AB .

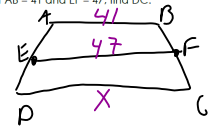


$$\frac{x+38}{2} = 22$$

$$x+38 = 44$$

$$x = 6$$

4) If $AB = 41$ and $EF = 47$, find DC .



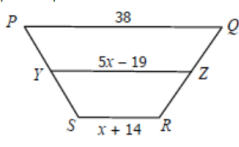
$$\frac{41+x}{2} = 47$$

$$41+x = 94$$

$$x = 52$$

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5) For trapezoid PQRS, Y and Z are midpoints of the legs. Find YZ.



$$\frac{x+14+38}{2} = \frac{5x-19}{1}$$

$$\frac{x+52}{2} = \frac{5x-19}{1}$$

$$x+52 = 2(5x-19)$$

$$x+52 = 10x-38$$

$$-x \quad -x$$

$$\frac{52 = 9x-38}{+38 \quad +38}$$

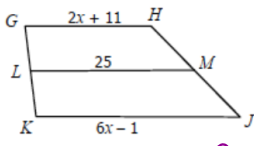
$$\frac{90 = 9x}{90 = 9x}$$

$$x = 10$$

YZ = $5(10) - 19 = 31$

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6) For trapezoid GHJK, L and M are midpoints of the legs. Find KJ.



$$\frac{2x+11+6x-1}{2} = 25$$

$$\frac{8x+10}{2} = 25$$

$$8x+10 = 50$$

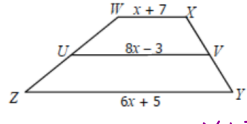
$$8x = 40$$

$$x = 5$$

KJ = $6(5) - 1 = 29$

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7) For trapezoid WXYZ, U and V are midpoints of the legs. Find UV.



$$\frac{x+7+6x+5}{2} = \frac{8x-3}{1}$$

$$\frac{7x+12}{2} = \frac{8x-3}{1}$$

$$7x+12 = 2(8x-3)$$

$$7x+12 = 16x-6$$

$$+6 \quad +6$$

$$\frac{7x+18 = 16x}{18 = 9x}$$

$$x = 2$$

UV = $8(2) - 3 = 13$

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