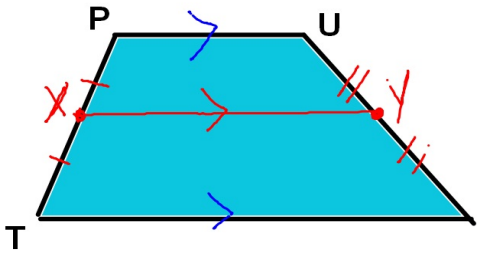
5-5 Trapezoids

Nov. 14

Std. 7.0

A **trapezoid** is a quadrilateral with exactly one pair of parallel sides.



trap. PUNT

parallel bases: $\overline{PU} \parallel \overline{TN}$

legs: $\overline{PT}$ and $\overline{UN}$

base angles: $\angle P$ & $\angle U$, $\angle T$ & $\angle N$

$m\angle P + m\angle T = 180$

$m\angle U + m\angle N = 180$

A **median** of a trapezoid is a segment connecting the midpoints of the legs.

Thm: The median of a trapezoid

1) is parallel to both bases
2) has length = average of the base lengths

$XY = \frac{PU + TN}{2}$

Ex. 1

GA = 13, XY = 19

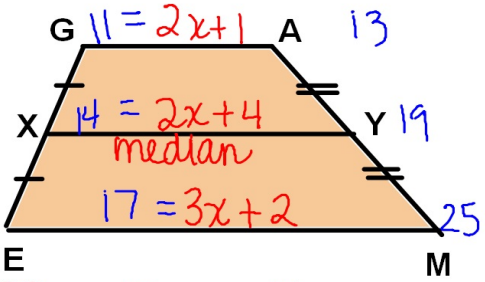
find EM

$XY = \frac{GA + EM}{2}$

$19 = \frac{13 + EM}{2}$

$38 = 13 + EM$

$25 = EM$



Ex. 2

GA = 2x + 1, XY = 2x + 4, EM = 3x + 2

find x

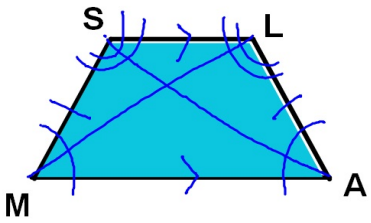
$2x + 4 = \frac{(2x+1) + (3x+2)}{2}$

$2x + 4 = \frac{5x + 3}{2}$

$4x + 8 = 5x + 3$

$5 = x$

An **isosceles trapezoid** is a trapezoid with congruent legs.



Isos. trap. SLAM

SM = LA

Properties

1) all trapezoid properties
2) base angles congruent $\angle SMA \cong \angle LAM$; $\angle MSL \cong \angle ALS$
3) diagonals congruent $\overline{SA} \cong \overline{LM}$