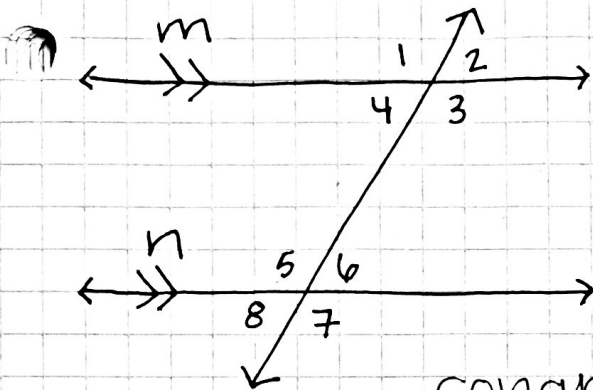


8.1 Segments + Parallel Lines



* congruent angles same!

* supplementary angles + to 180° !

Congruent

- * $1+3$
- * $2+4$
- * $5+7$
- * $6+8$
- * $1+7$
- * $4+6$

Supplement

- * $5+6$
- * $8+7$
- * $1+2$
- * $4+3$
- * $1+4$
- * $2+3$
- * $5+8$
- * $6+7$

- * vertical ($\angle 1 + \angle 3$)
- * corresponding ($\angle 1 + \angle 5$)
- * alternate interior ($\angle 4 + \angle 6$)
- * alternate exterior ($\angle 1 + \angle 7$)

- * same side interior ($\angle 4 + \angle 5$)
- * adjacent ($\angle 1 + \angle 2$)
- * same side exterior ($\angle 1 + \angle 8$)

PROVE $\angle 1 \cong \angle 3$

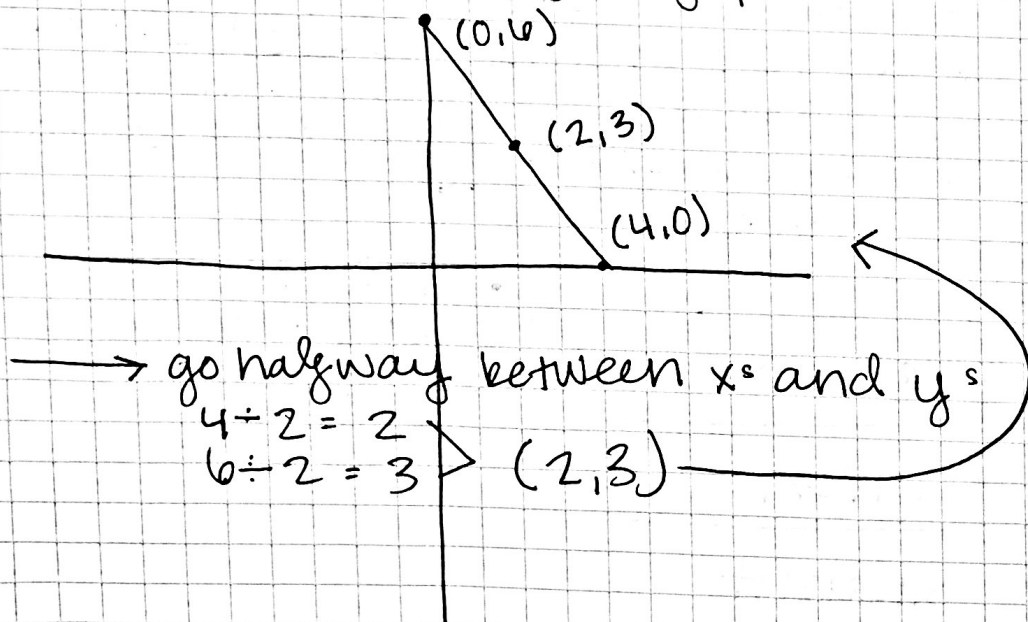
• straight angle theorem - two angles that form a line add to 180°

Statement	Reason
$m \parallel n$	given
$m\angle 1 + m\angle 2 = 180^\circ$ $m\angle 2 + m\angle 3 = 180^\circ$	Straight angle theorem
$m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$	substitution property
$m\angle 1 = m\angle 3$	subtraction property
$\angle 1 \cong \angle 3$	definition of congruency

Prove same-side interior angles are supplementary ($m\angle 3 + m\angle 4 = 180^\circ$)

Statement	Reason
$m \parallel n$	given
# $m\angle 3 + m\angle 4 = 180^\circ$	Adjacent angles
$\angle 4 \cong \angle 6$	Alternate interior
$m\angle 3 + m\angle 6 = 180^\circ$	Substitution Property

* midpoint : halfway point from graph



find the midpoint of a segment with endpoints $(2, 13)$ and $(10, 20)$

~~$\frac{1}{2}(3+2) = 2.5$
 $\frac{1}{2}(10+2) = 6$~~

~~$\frac{10+2}{2} = 6 \rightarrow 4$
 $\frac{20-13}{2} = 3.5 \rightarrow 3.5$~~

~~$(4, 3.5)$~~

$(2, 13)$

$10 - 2 = 8 \div 2 = 4 \rightarrow 2 + 4 = 6$

$(10, 20)$

$20 - 13 = 7 \div 2 = 3.5 \rightarrow 13 + 3.5 = 16.5$

$(6, 16.5)$

Find the other endpoint given an endpoint and the midpoint:

$E: (-4, 6)$
 $+9 < \quad > +15$

$M: (5, 21)$

$E: (\text{?}, 36)$
 $+12 < \quad > +15$

$(14, 36)$

given a segment with endpoints
(0,0) and (10,10). find a point
that partitions the segment in a
1:4 ratio.

*partition: split up

$$x: \frac{10}{5} = 2$$

$$y: \frac{10}{5} = 2$$

