Warm Up

Write an equation of the line given the following information:

1. slope = $\frac{1}{2}$
   y-int. = 5

$y = \frac{1}{2}x + 5$

2. slope = 3
   through: (2, 9)

$y = 3x + 3$

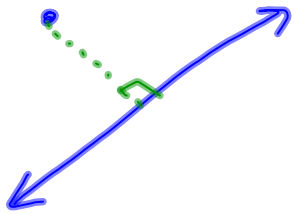
3. parallel to: $y = \frac{2}{3}x - 8$
   through: (3, 1)

$y = \frac{2}{3}x - 1$

3-6 Proof with Perpendicular Lines

Distance between a point and a line

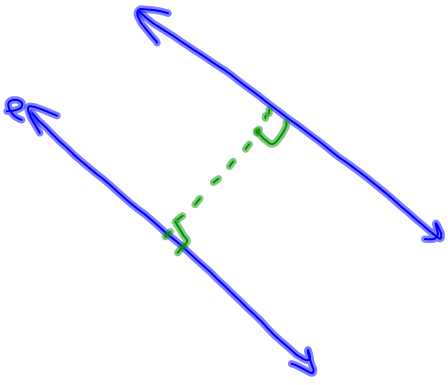
is always a perpendicular distance.



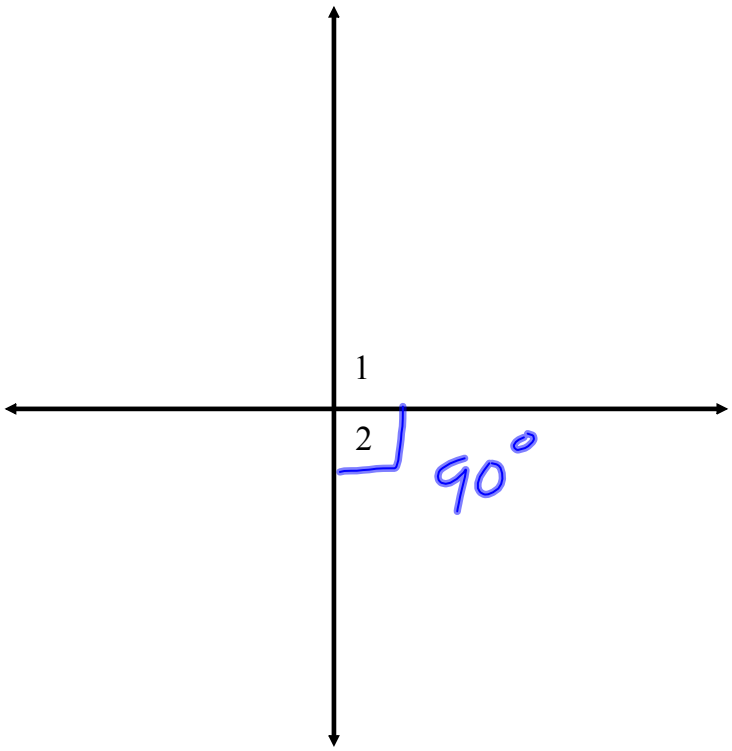
Distance between two lines

Parallel

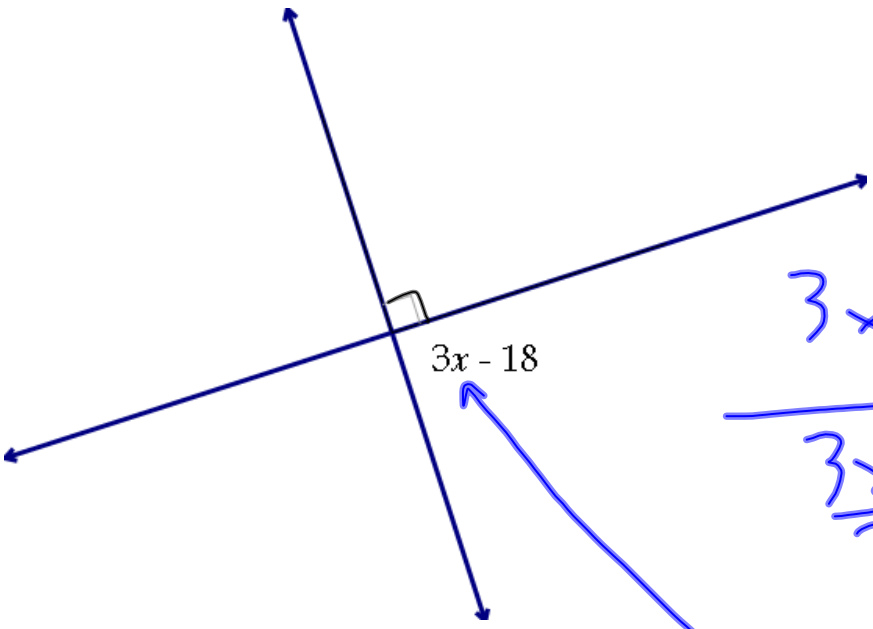
is a ∥ distance



Ex 1 $\angle 1 \cong \angle 2$ What can be concluded about $m\angle 2$?



Ex. 2 Find the value of x.



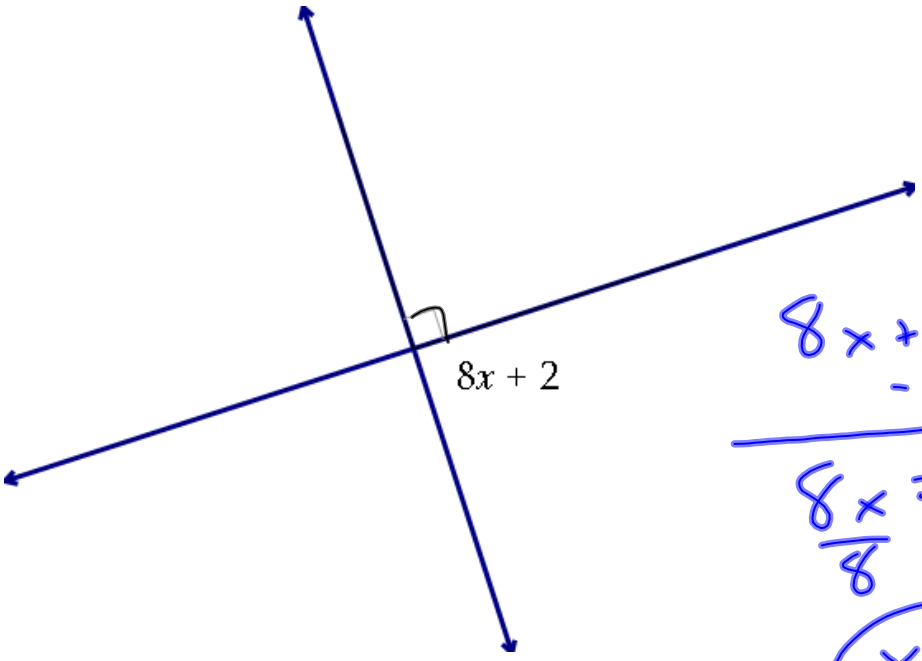
$3x - 18 = 90$

$+18 \quad +18$

$\frac{3x}{3} = \frac{108}{3}$

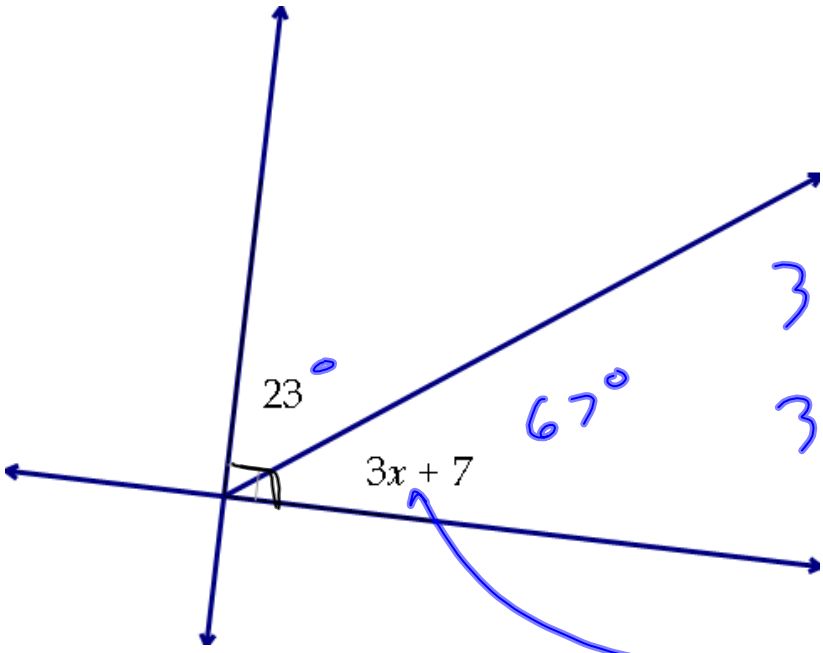
$x = 36$

Ex. 3 Find the value of x.



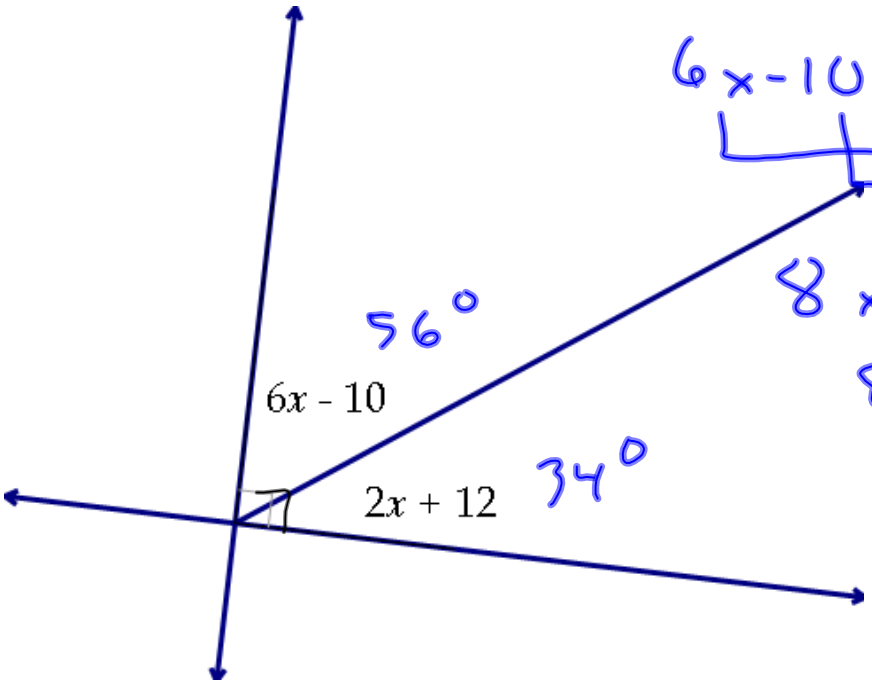
$8x+2=90$
$-2 \quad -2$
$8x=88$
$\frac{8x}{8}=\frac{88}{8}$
$x=11$

Ex. 4 Find the value of x.



$3x+7+23=90$
$3x+30=90$
$3x=60$
$x=20$

Ex. 5 Find the value of x.



$6x-10+2x+12=90$

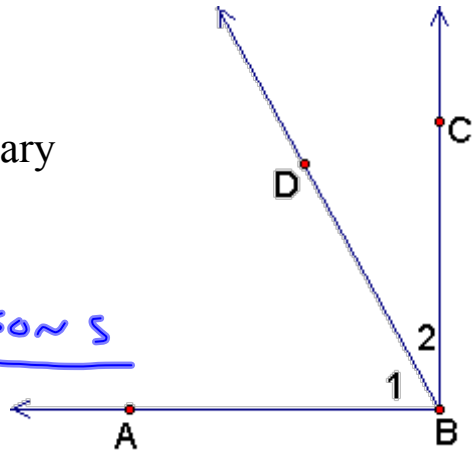
$8x+2=90$

$8x=88$

$x=11$

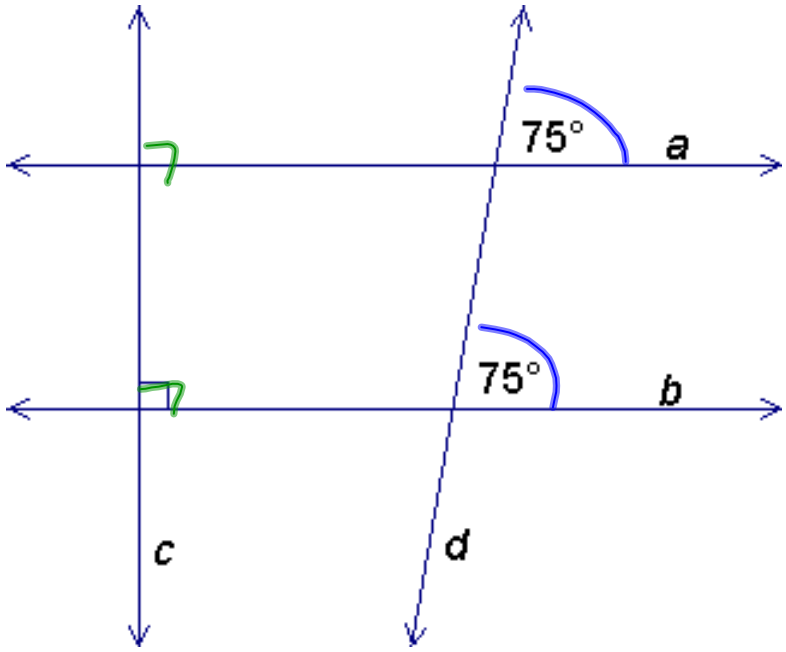
Ex 6 Write a two-column proof.

Given: $\angle 1$ and $\angle 2$ are complementary
Prove: $\overleftrightarrow{BA} \perp \overleftrightarrow{BC}$



STATEMENTS	REASONS
$\angle 1 + \angle 2$ are comp.	Given
$m\angle 1 + m\angle 2 = 90°$	Def. of comp.
$m\angle 1 + m\angle 2 = m\angle ABC$	Angle Add. Post.
$m\angle ABC = 90°$	Substitution
$\overleftrightarrow{BA} \perp \overleftrightarrow{BC}$	DEF. OF $\perp$

Ex 7 Which lines must be perpendicular?



$c \perp b$ given

$c \perp a$

$a \parallel b$