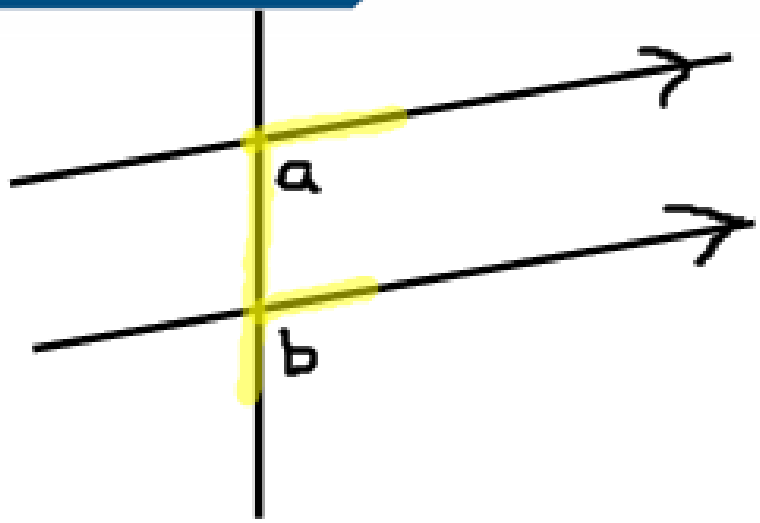
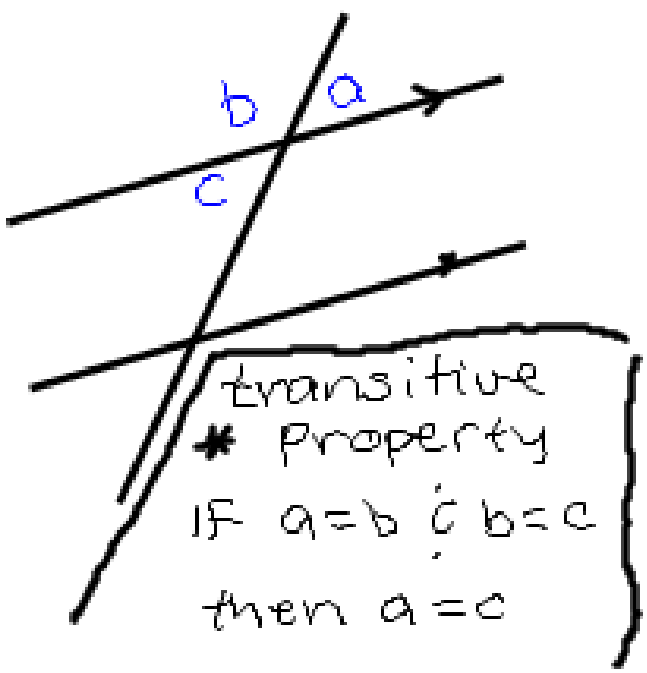
2.2 Angles Formed by Parallel Lines



$\angle a = \angle b$ corresponding angles (F Theorem)

Proof of X Theorem - vertically opposite angles

$\angle a = \angle c$

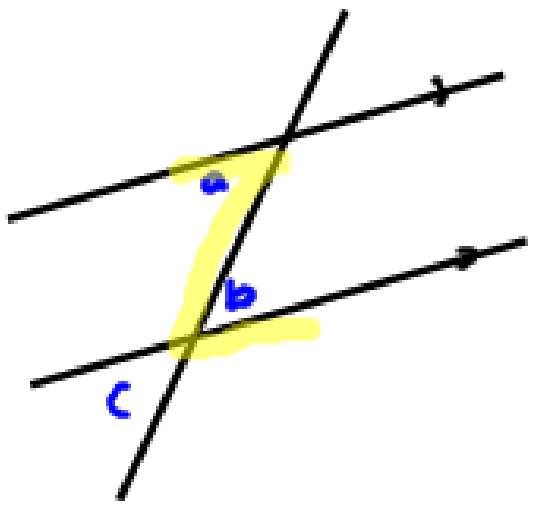


Statement	justification
$\angle a = 180° - \angle b$	supplemental (add to 180°)
$\angle c = 180° - \angle b$	"
$\therefore \angle a = \angle c$	transitive property

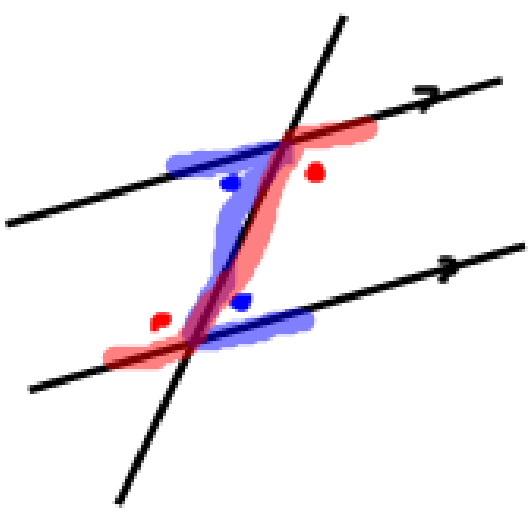
alternate interior angles

Proof of Z Theorem

$\angle a = \angle b$

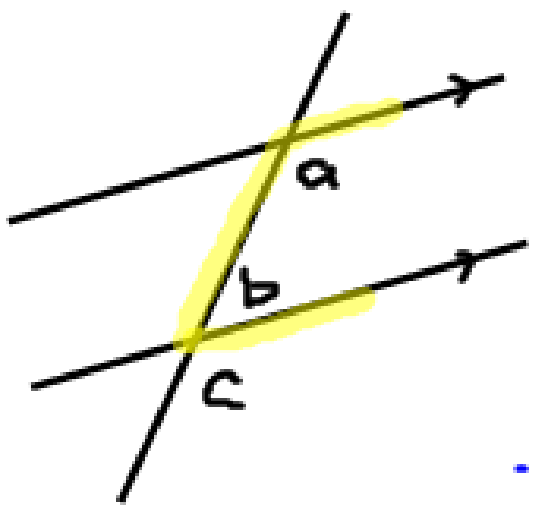


Statement	justification
$\angle a = \angle c$	corresponding angles (F-Theo)
$\angle c = \angle b$	vertically opp. angles (X-Theo)
$\therefore \angle a = \angle b$	transitive property



$\angle a + \angle b = 180°$

Proof of C Theorem



Statement	justification
$\angle a = \angle c$	F·theorem
$\angle c = 180° - \angle b$	Supplemental
$\therefore \angle a = 180° - \angle b$	transitive property
$\therefore \angle a + \angle b = 180°$	rearranged.

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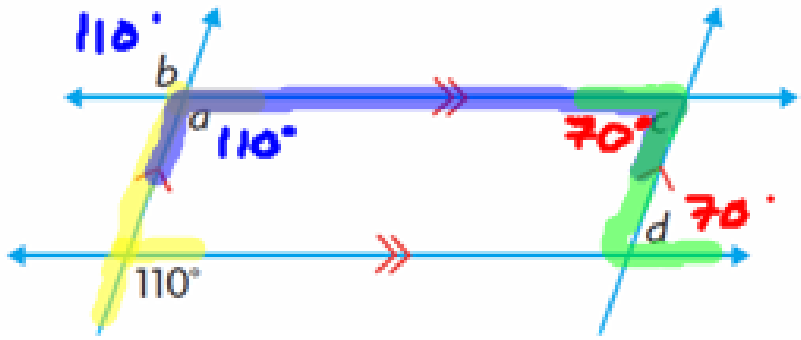
EXAMPLE 2 Using reasoning to determine unknown angles

Determine the measures of a, b, c, and d.



$\angle a = 110°$ F theorem

$\angle b = 110°$ X · Theorem

$\angle c = 180° - \angle a$ C Theorem

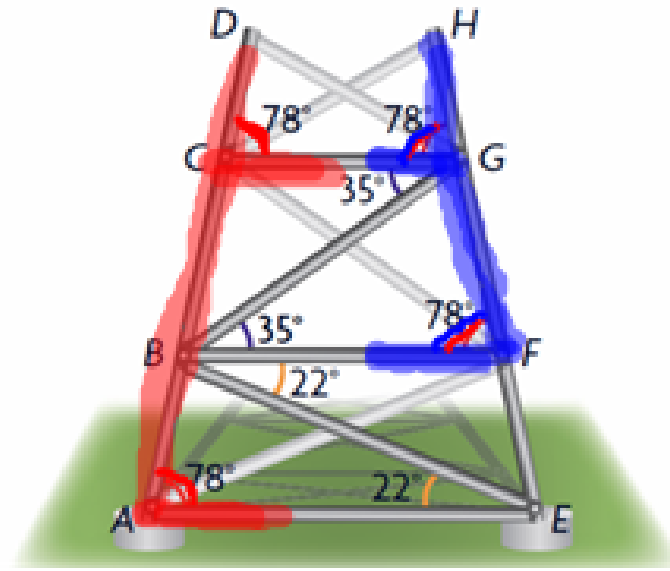
$= 180° - 110°$

$\angle c = 70°$

$\angle d = 70°$ Z Theorem

EXAMPLE 3 Using angle properties to prove that lines are parallel

One side of a cellphone tower will be built as shown. Use the angle measures to prove that braces CG, BF, and AE are parallel.



$\angle DCG = \angle BAE$

$\therefore CG // AE$

$\angle HGC = \angle GFB$

$\therefore CG // BF$

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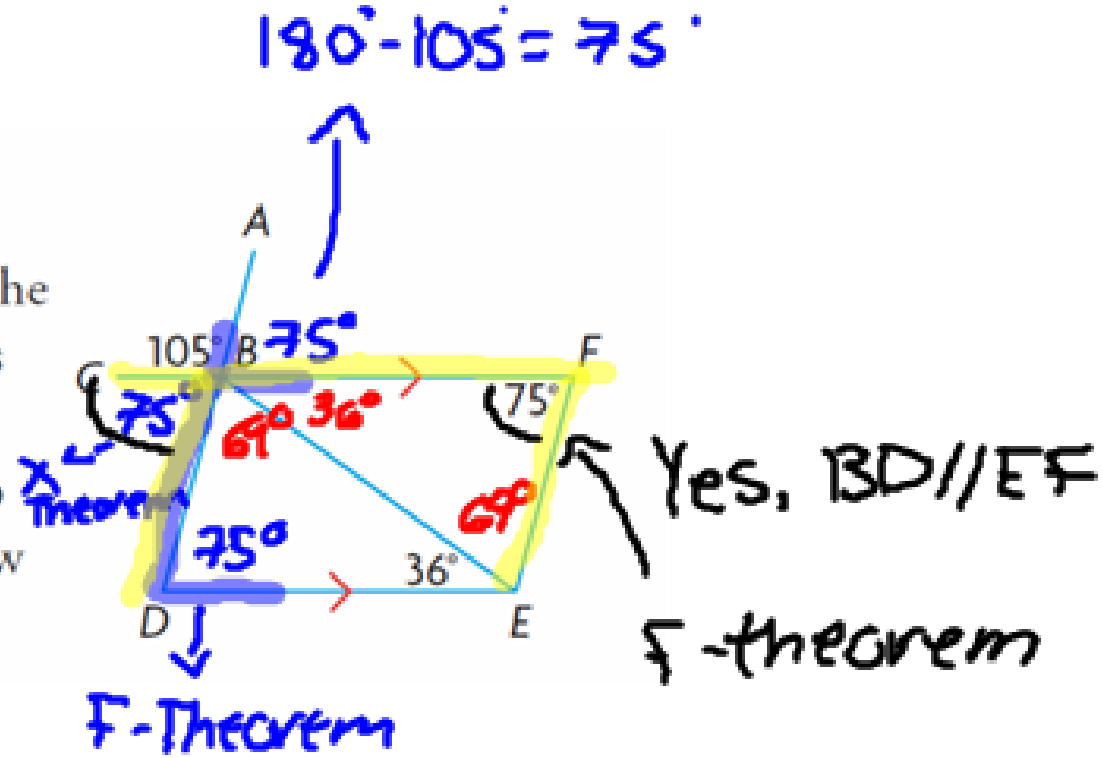
5. a) Determine the measures of all the unknown angles in the diagram.

b) Is BD parallel to EF? Explain how you know.



All angles in a triangle add to 180°

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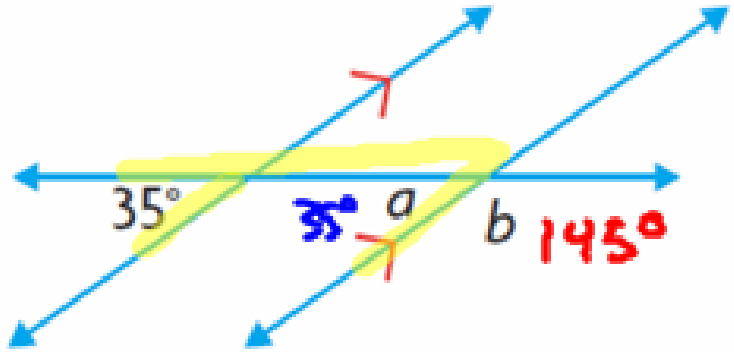
3. Determine the values of a and b.

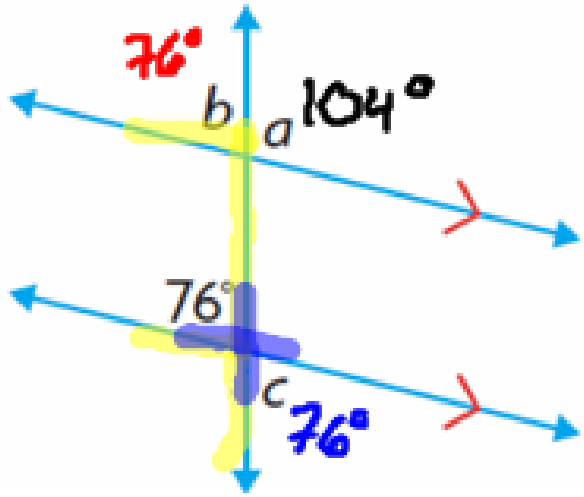


$\angle a = 35°$ - ∡ Theorem

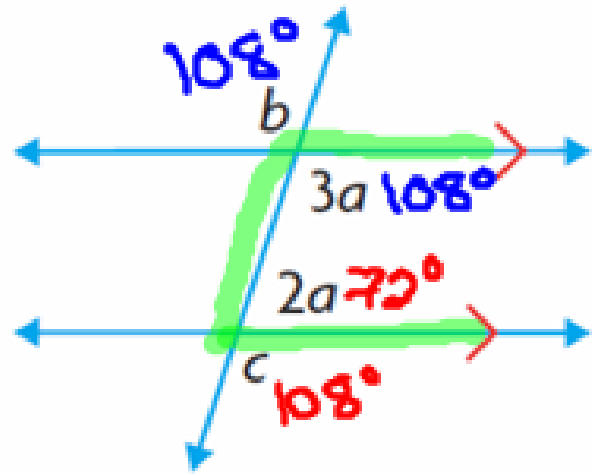
$\angle b = 145°$ - supplemental

5. Determine the values of a, b, and c.

a)



b)



$\angle b = 76°$ - F Theorem

$\angle c = 76°$ - X Theorem

$\angle a = 104°$ - supplemental

$3a + 2a = 180°$ C theorem

$5a = 180°$

$a = 36°$

$3a = 3(36) = 108°$

$\angle b = 108°$ X theorem

$2a = 2(36) = 72°$

$\angle c = 108°$ supplemental or F Theorem

Do p. 78-82 - # 1-6, 8,10, 12, 15, 18