Notes - Geometry Theorems.doc

*** Now that the notes are taken care of...

REVIEW??? GMF 10 - Angle Properties

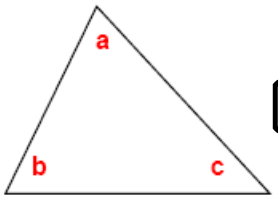
We better do some examples to UNDERSTAND these BIG ideas!!!

Geometry Theorems...

(SATT)

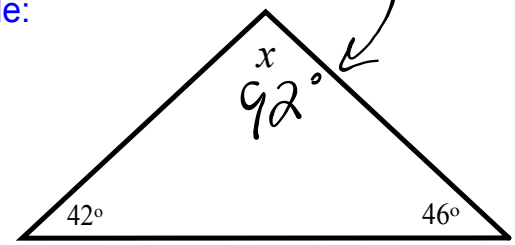
Triangle Angle Sum Theorem:

The sum of the interior angles of any triangle is 180°.



$a + b + c = 180°$

Example:



Isosceles Triangle Theorem:

In an isosceles triangle, the base angles are equal.

The two angles that are opposite to the equal sides.

a = b

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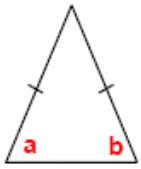
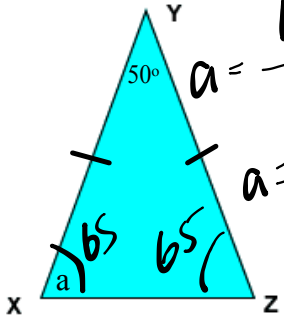


EXAMPLES...

1)

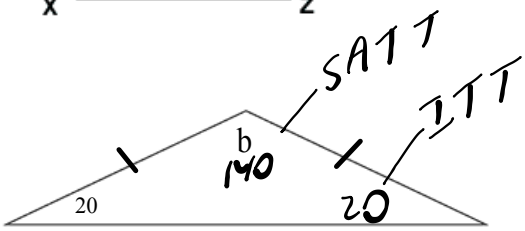


$a = \frac{180-50}{2}$

$a = 65$

65 65

2)



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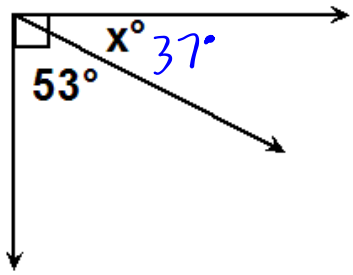
- **Complementary Angles:** CAT

  Two or more angles that have a sum of 90°.

Examples:

(1) What is the complement of a 50° angle? 40°

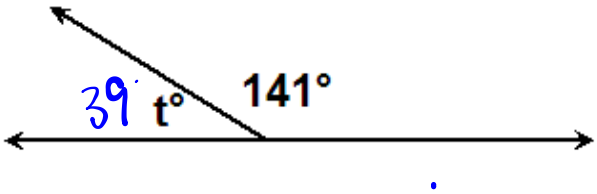
(2) Determine the measure of the missing angle.



- **Supplementary Angles**: SAT

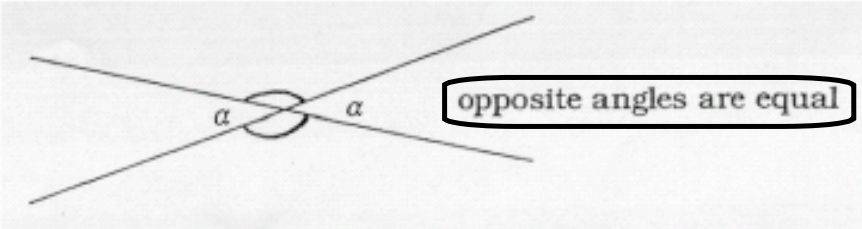
  Two or more angles that have a sum of 180°.

Examples:



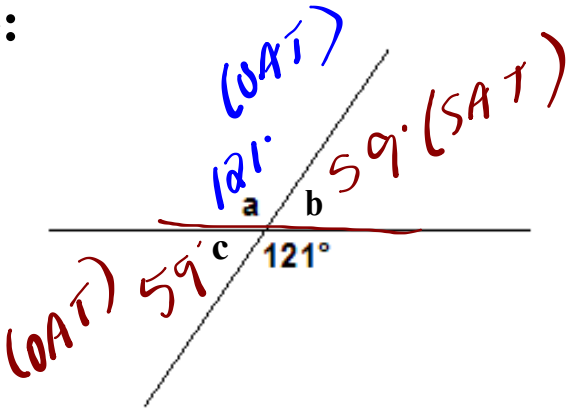
Opposite Angle Theorem... OAT

When 2 straight lines cross, 2 pairs of opposite angles are formed. Opposite angles are equal in size



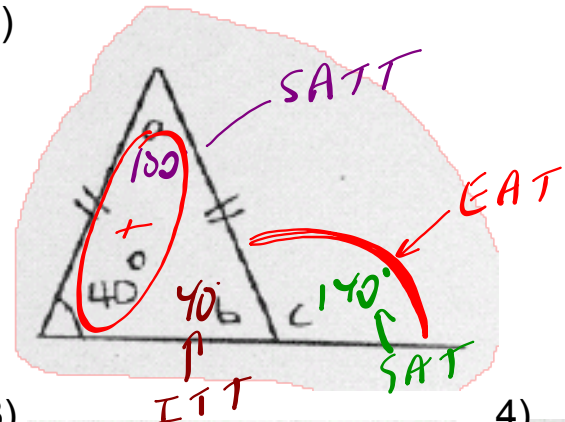
In geometry, angles or lines marked with the same symbol are the same size.

Example:

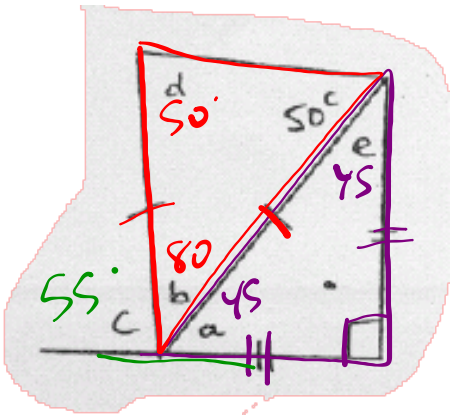


EXERCISE: Use geometry theroems to determine the measure of missing angles..

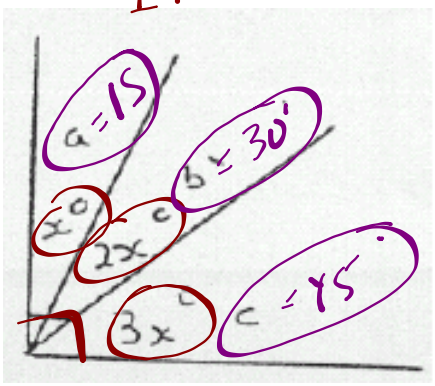
1)



2)



3)

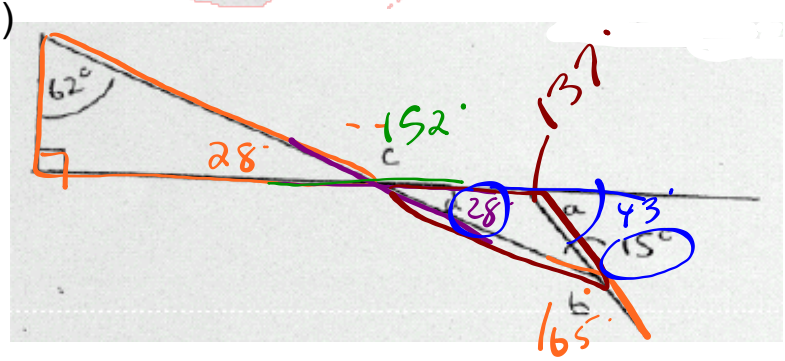


$x + 2x + 3x = 90$

$\frac{6x}{6} = \frac{90}{6}$

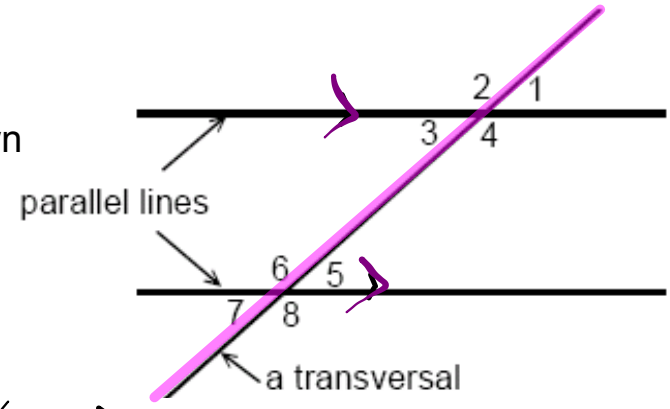
$x = 15$

4)



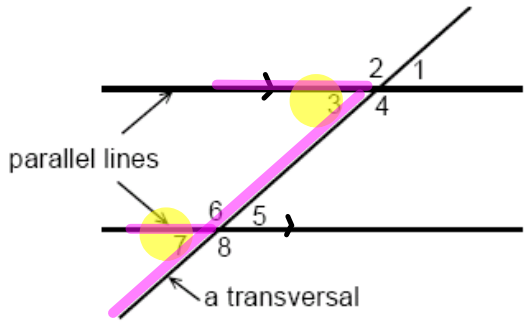
Parallel Line Theorems

A transversal is a third line that crosses two or more lines, as shown in the illustration to the right.



Corresponding Angles: (A)

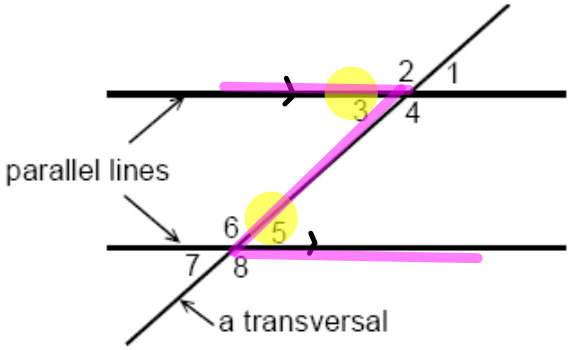
Pairs of angles on the same side of a transversal and the same side of the parallel lines



CORRESPONDING ANGLES ARE EQUAL

Alternate Interior Angles:

Pairs of angles on the opposite sides of a transversal and between the parallel lines



AIA

ALTERNATE INTERIOR ANGLES ARE EQUAL

Co-Interior Angles (Same-side Interior):

Pairs of angles on the same side of a transversal and between the parallel lines

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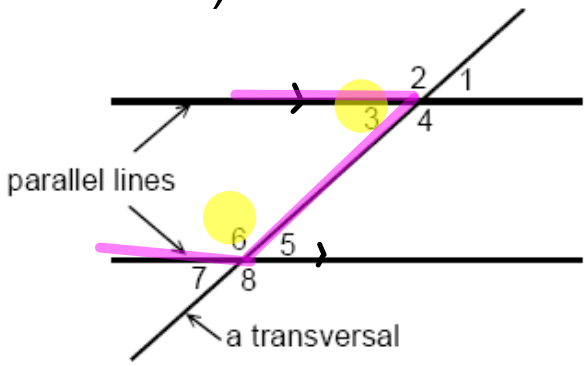
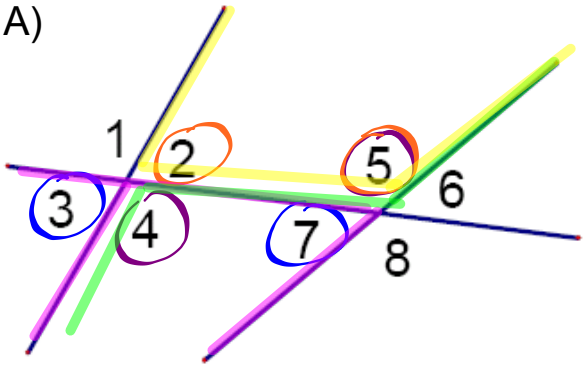


CO-INTERIOR ANGLES ARE SUPPLEMENTARY

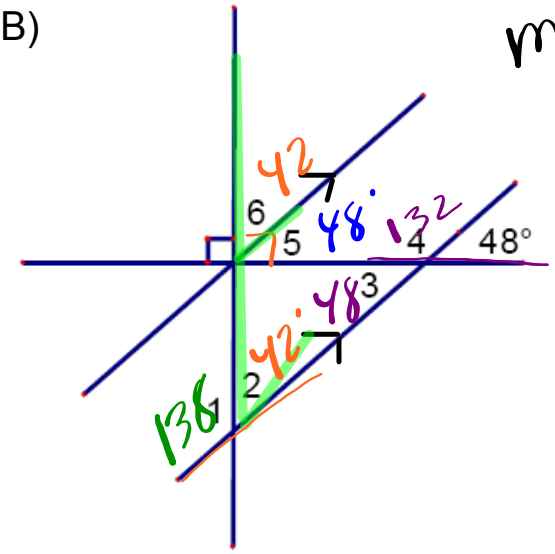
EXERCISE: Practice...

A)



1. <3 and <__7__ are corresponding angles.
2. <4 and <__5__ are alternate interior angles.
3. <5 and <__2__ are same-side interior angles. (co interior)

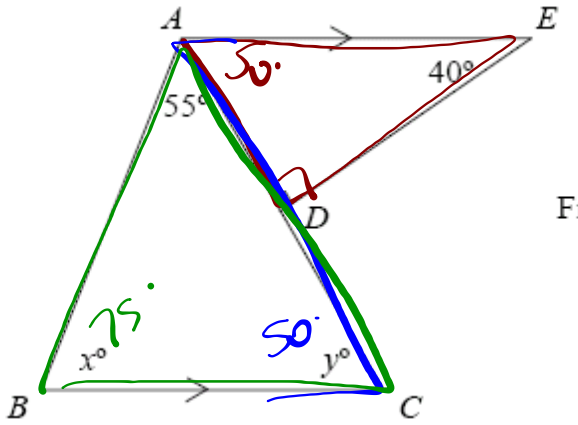
B)



measure → m∠1 ← angle

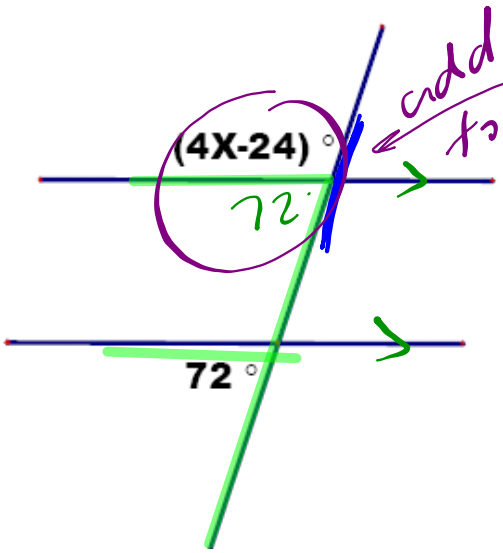
1. m<1 = __138°__
2. m<2 = __42°__
3. m<3 = __48°__
4. m<4 = __132°__
5. m<5 = __48°__
6. m<6 = __42°__

C)



Find $x°$ and $y°$.

D)



add to 180°

$4x - 24 + 72° = 180°$

$4x + 48 = 180$

$4x = 180 - 48$

$x = 33°$

$\frac{4x}{4} = \frac{132}{4}$

$x = 33°$

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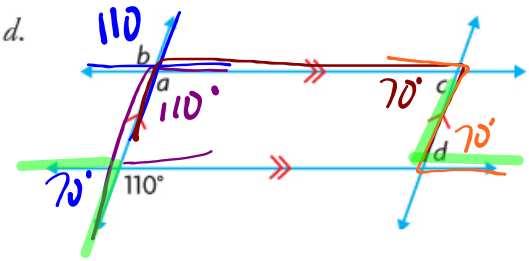
EXAMPLE 2 Using reasoning to determine unknown angles

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

$a = 110°$ $c = 70°$

$b = 110°$ $d = 70°$



Kebeh's Solution

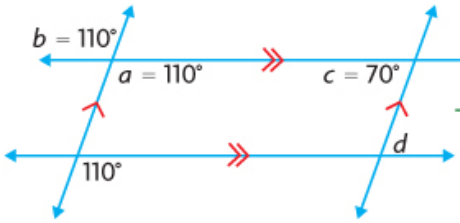
$\angle a = 110°$

The 110° angle and $\angle a$ are corresponding. Since the lines are parallel, the 110° angle and $\angle a$ are equal.

$\angle a = \angle b$
$\angle b = 110°$

Vertically opposite angles are equal.

$\angle c + \angle a = 180°$
$\angle c + 110° = 180°$
$\angle c = 70°$



$\angle c$ and $\angle a$ are interior angles on the same side of a transversal. Since the lines are parallel, $\angle c$ and $\angle a$ are supplementary.

I updated the diagram.

$\angle c = \angle d$
$\angle d = 70°$

$\angle c$ and $\angle d$ are alternate interior angles. Since the lines are parallel, $\angle c$ and $\angle d$ are equal.

The measures of the angles are:
$\angle a = 110°$; $\angle b = 110°$;
$\angle c = 70°$; $\angle d = 70°$.

Homework...

Assignment - Angle Properties.pdf

p. 72: #2

p. 78: #1, 4, 15

Attachments

Notes - Geometry Theorems.doc

Assignment - Angle Properties.pdf