

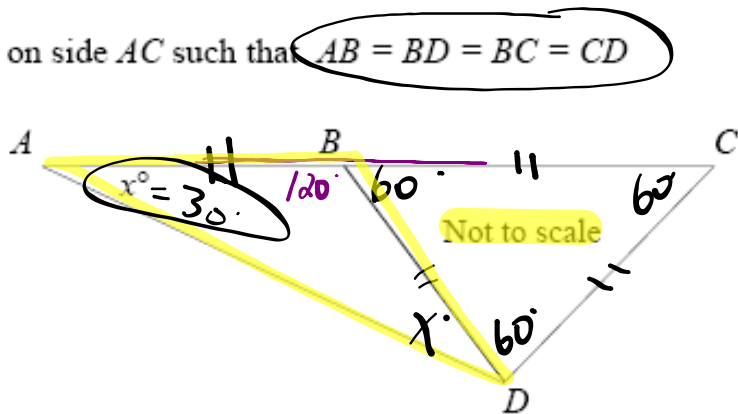
Warm Up...

ACD is a triangle and point B lies on side AC such that $AB = BD = BC = CD$

Find angle BAD (x°):

$$x = \frac{180 - 120}{2}$$

$$x = 30^\circ$$



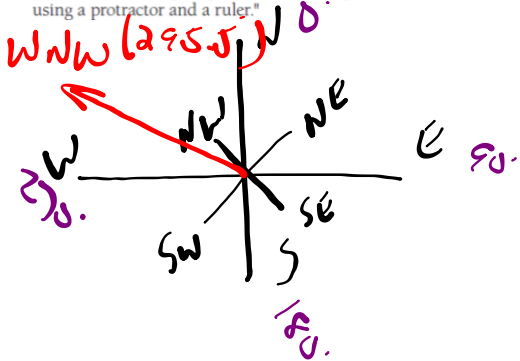
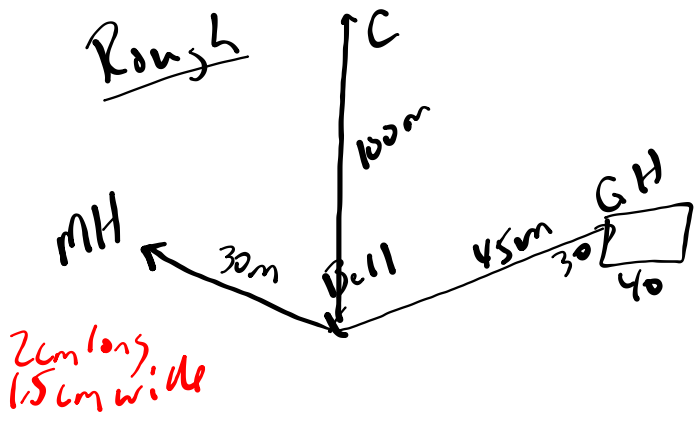
HW questions...

6. Gaelic Day, a celebration of the Scottish language and culture, happens yearly at the Gaelic College of Celtic Arts and Crafts on Cape Breton Island in St. Ann's, Nova Scotia.

For the celebration you are asked to draw a small map to help guests find their way to events. Sketch a map featuring several locations, without using any tools. Estimate the distances and directions. First draw the school bell, which will be the reference point for the other locations. From the bell, draw the following:

- Mackenzie Hall is located 30 m WNW of the bell;
- The Clachan, or weaving studio, is 100 m north of the bell; and
- The Great Hall of Clans' southwestern corner is 45 m from the bell and has a true bearing of 75°. The building is 40 m long and 30 m wide.

Use a scale for the map in which 1 cm equals 20 m on land. After you have finished, compare your estimated angle and distance measures using a protractor and a ruler.



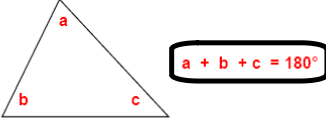
Notes - Geometry Theorems.doc

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

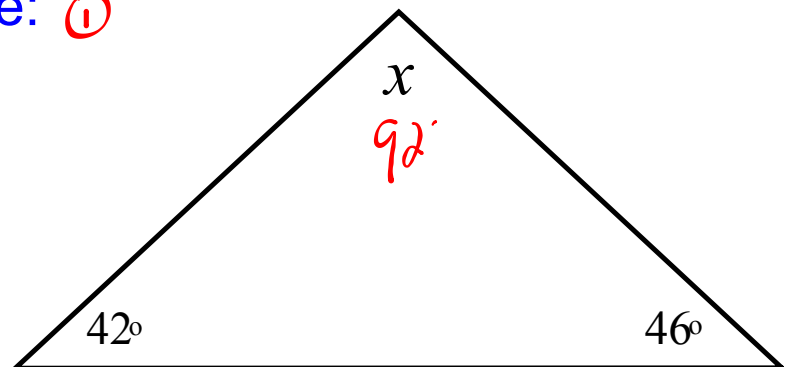
let's do some examples to UNDERSTAND these **BIG** ideas!!!

Geometry Theorems...

Triangle Angle Sum Theorem:
 The sum of the interior angles of any triangle is 180° .



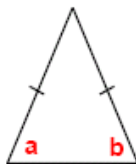
Example: ①



Isosceles Triangle Theorem:

In an isosceles triangle, the base angles are equal.

The two angles that are opposite to the equal sides.

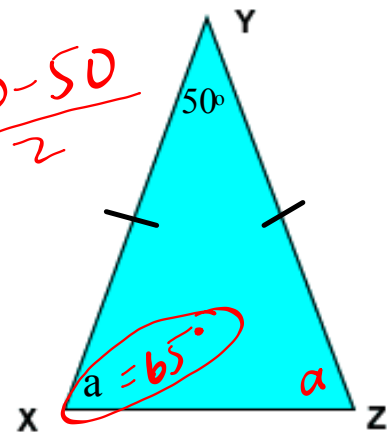


$a = b$

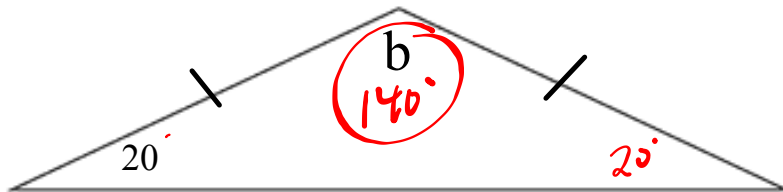
EXAMPLES...

1)

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



2)



$$180 - 20 - 20$$

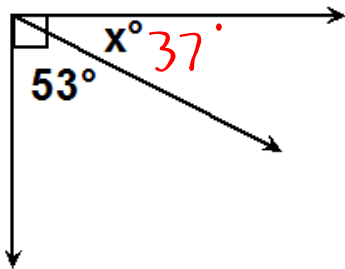
- **Complementary Angles:**

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

Examples:

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

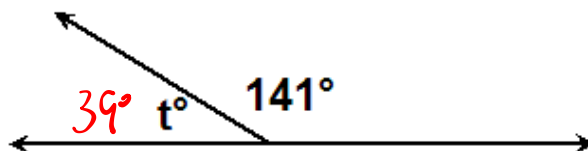
(2) Determine the measure of the missing angle.



- **Supplementary Angles:**

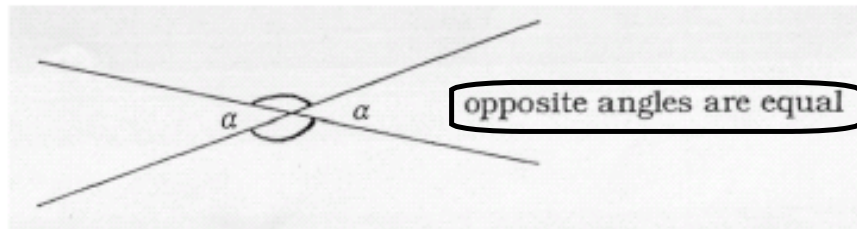
Two or more angles that have a sum of 180° .

Examples:



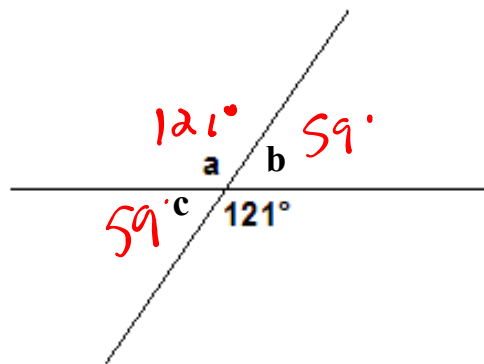
Opposite Angle Theorem...

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



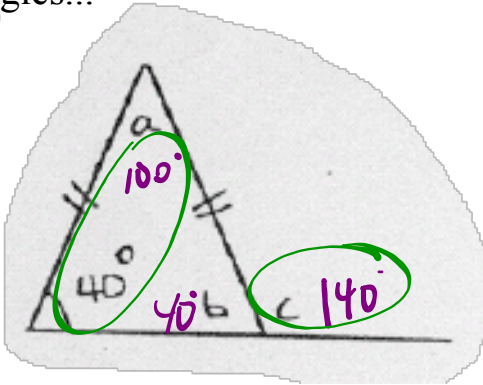
In geometry, angles or lines marked with the same symbol are the same size.

Example:

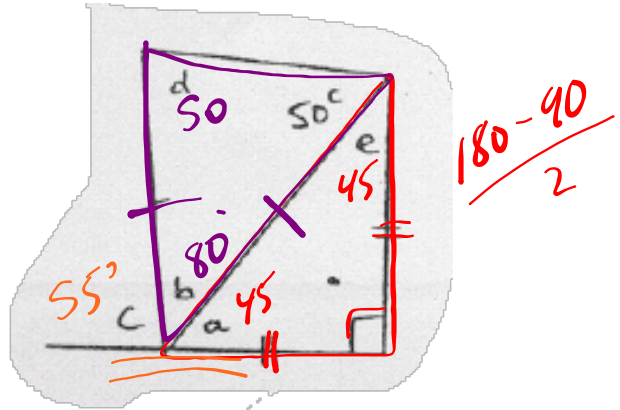


EXERCISE: Use geometry theorems to determine the measure of missing angles...

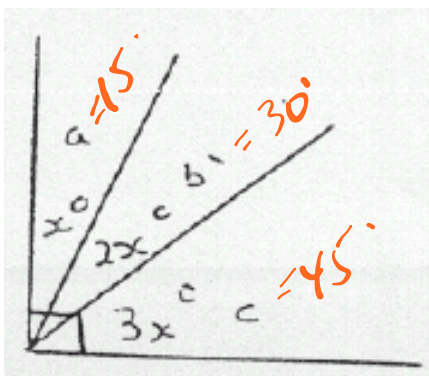
1)



2)



3)

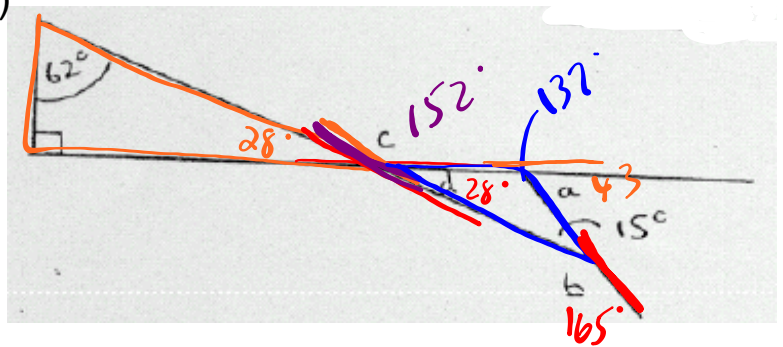


$$x + 2x + 3x = 90$$

$$6x = 90$$

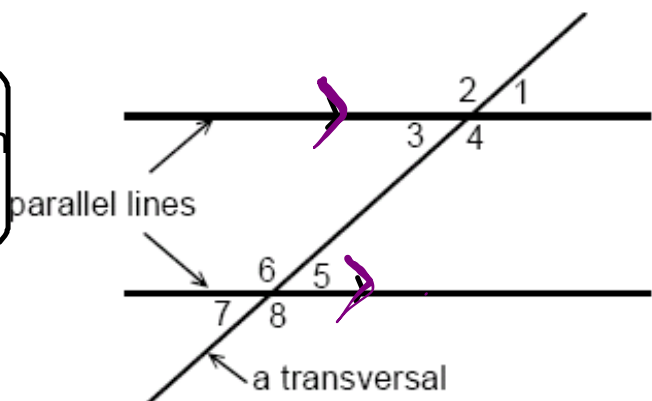
$$x = 15$$

4)



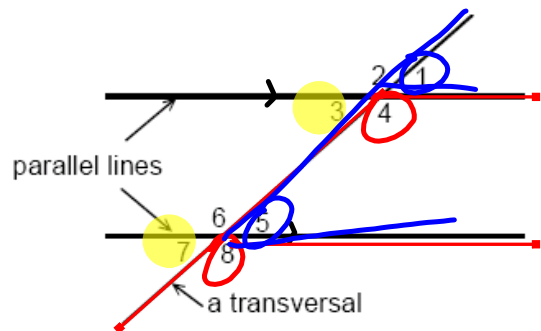
Parallel Line Theorems

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



Corresponding Angles:

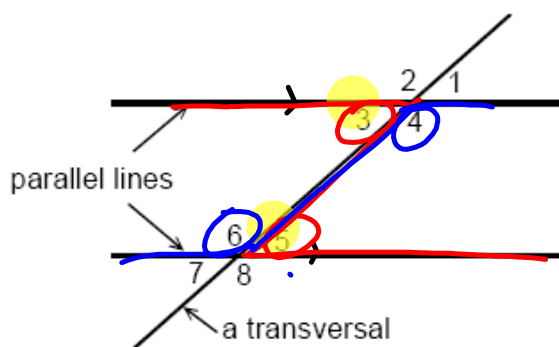
Pairs of angles on the same side of a transversal and the same side of the parallel lines



CORRESPONDING ANGLES ARE EQUAL

Alternate Interior Angles:

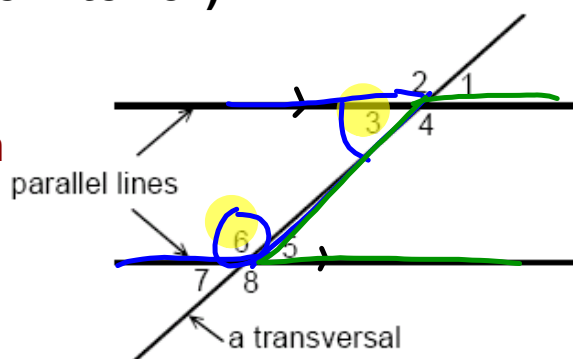
Pairs of angles on the opposite sides of a transversal and between the parallel lines



ALTERNATE INTERIOR ANGLES ARE EQUAL

Co-Interior Angles (Same-side Interior):

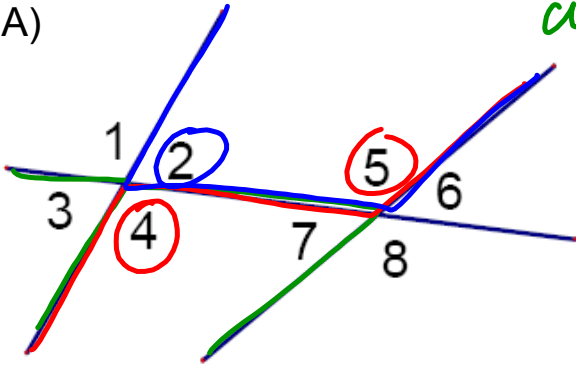
Pairs of angles on the same side of a transversal and between the parallel lines



CO-INTERIOR ANGLES ARE SUPPLEMENTARY

EXERCISE: Practice...

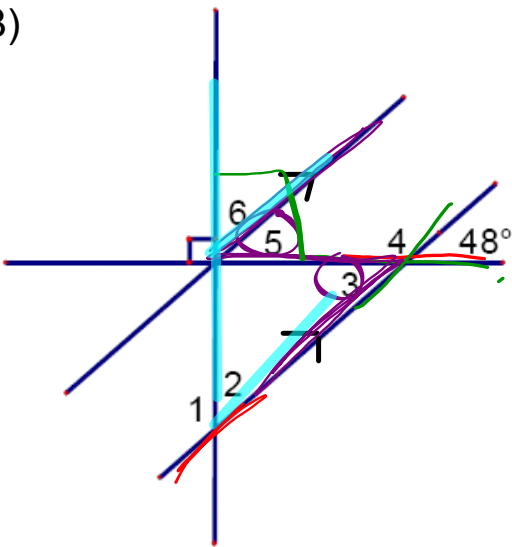
A)



corresponding $\rightarrow \angle 3$

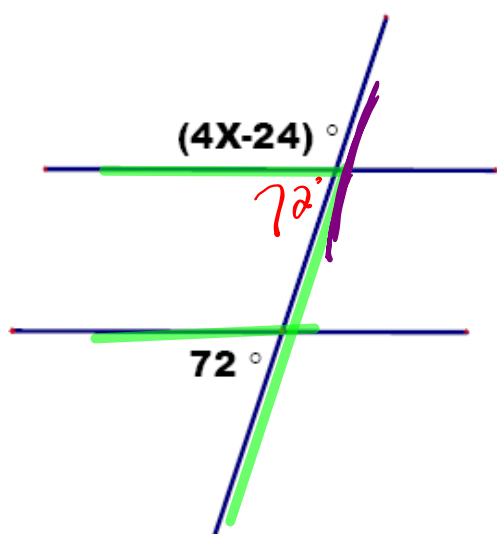
1. $\angle 3$ and $\angle 7$ are corresponding angles.
2. $\angle 4$ and $\angle 5$ are alternate interior angles.
3. $\angle 5$ and $\angle 2$ are ~~same-side~~ ^{co-} interior angles.

B)



1. $m\angle 1 = 138^\circ$
2. $m\angle 2 = 42^\circ$
3. $m\angle 3 = 48^\circ$
4. $m\angle 4 = 132^\circ$
5. $m\angle 5 = 48^\circ$
6. $m\angle 6 = 42^\circ$

D)



$$\begin{aligned}
 (4x - 24) + 72 &= 180 \\
 4x &= 180 + 24 - 72 \\
 4x &= 132 \\
 x &= \frac{132}{4} \\
 x &= 33
 \end{aligned}$$

HW: Complete the following...

Worksheet - Angle Properties.pdf

Find the missing values

Handwritten student work showing various geometric diagrams with angles labeled a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z.

2. Find the values of x and y :

a) b) c)

3. Find the values of $w, x, y,$ and z :

a) b) c) d) e) f)

Exercises 7 - 6

A 1. Find the value of x :

a) b) c)

d) e) f)

g) h) i)

State all the facts you can about each figure:

a) b) c)

Side BC of $\triangle ABC$ is extended to D . If $BC = AC$, prove that $\angle ACD = 2\angle A$.

$\angle A = \angle B$ (Isosceles Triangle Theorem)
 $\angle A + \angle B = \angle ACD$ (Exterior Angle Theorem)
 Therefore, $\angle ACD = 2\angle A$

Find the values of x and y :

a) b) c) d) e) f)

Attachments

Notes - Geometry Theorems.doc

Worksheet - Angle Properties.pdf