REVIEW OF TERMS AND CONNECTIONS

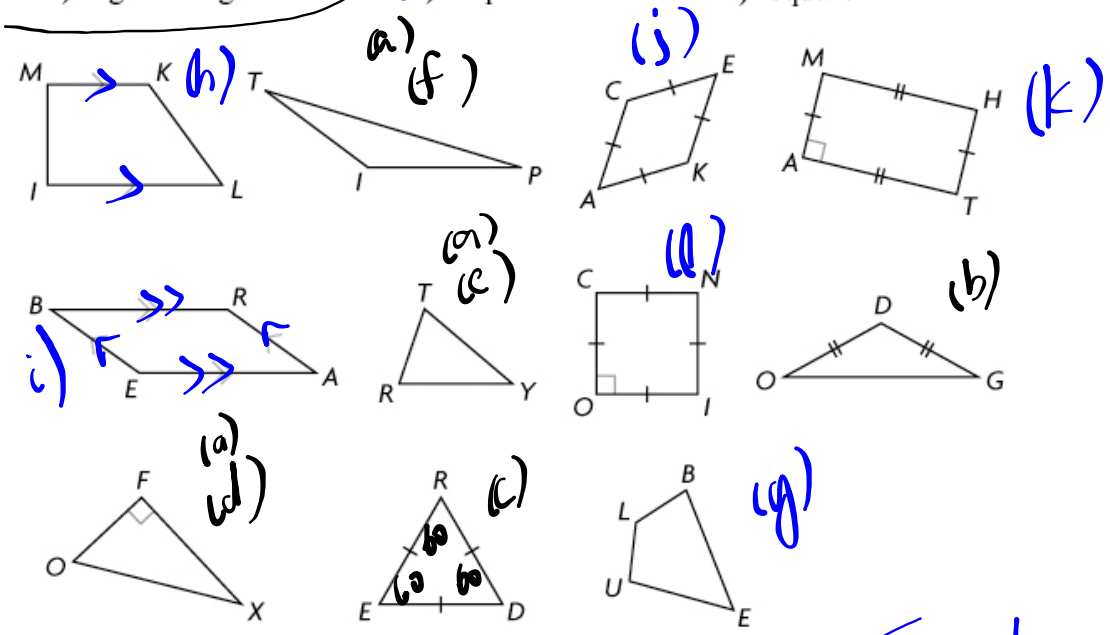
Pull for Lesson Notes

The terms can be dragged to match the shapes.

WORDS You Need to Communicate Effectively

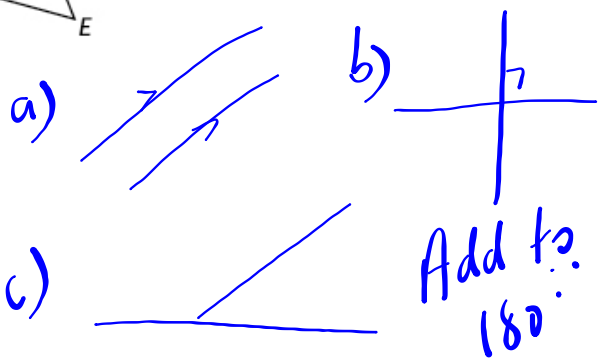
1. Match each term with one shape.

a) scalene triangle
b) isosceles triangle
c) equilateral triangle
d) right triangle
e) acute triangle
f) obtuse triangle
g) quadrilateral
h) trapezoid
i) parallelogram
j) rhombus
k) rectangle
l) square



2. Draw a diagram to illustrate each term.

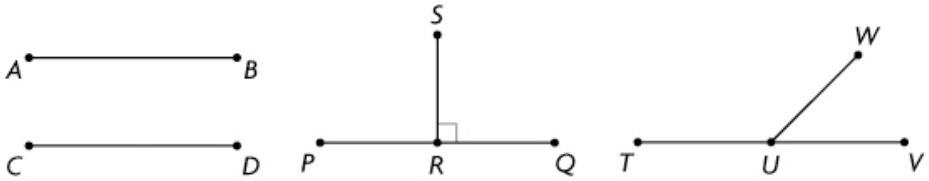
a) parallel lines
b) perpendicular lines
c) supplementary angles



Answers

1. **a)** $\triangle TRY$ **e)** $\triangle TRY$ **i)** *BEAR*
b) $\triangle DOG$ **f)** $\triangle TIP$ **j)** e.g., *CAKE*
c) $\triangle RED$ **g)** e.g., *BLUE* **k)** e.g., *MATH*
d) $\triangle FOX$ **h)** e.g., *MILK* **l)** e.g., *COIN*

2. **a)** parallel lines **b)** perpendicular lines **c)** $\angle TUW$ and $\angle WUV$ are supplementary.



Chapter 2 - Angle Properties

converse

A statement that is formed by switching the premise and the conclusion of another statement.

2.1 Exploring Parallel Lines

GOAL

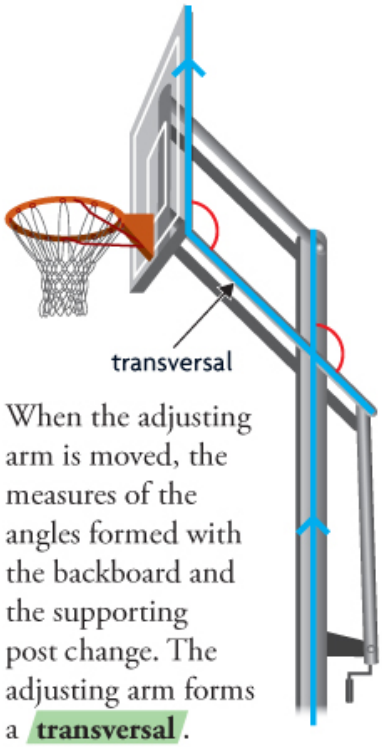
Identify relationships among the measures of angles formed by intersecting lines.

Communication Tip

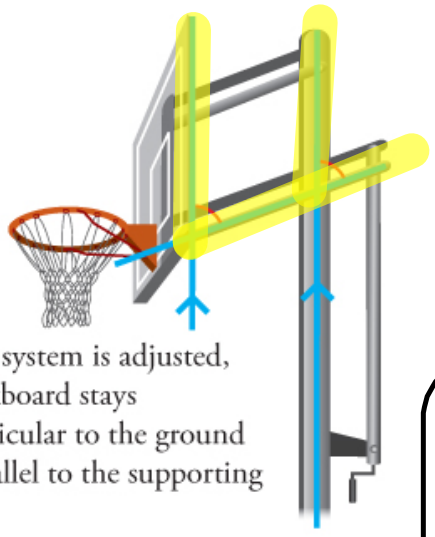
If lines *PW and QS* are parallel, you can represent the relationship using the symbol ||:
PW || *QS*

EXPLORE the Math

A sports equipment manufacturer builds portable basketball systems, like those shown here. These systems can be adjusted to different heights.



When the adjusting arm is moved, the measures of the angles formed with the backboard and the supporting post change. The adjusting arm forms a **transversal**.

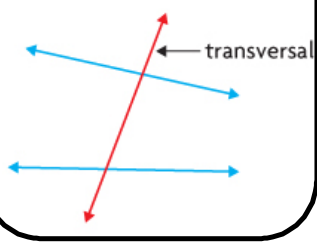


When a system is adjusted, the backboard stays perpendicular to the ground and parallel to the supporting post.

? When a transversal intersects two parallel lines, how are the angle measures related?

transversal

A line that intersects two or more other lines at distinct points.

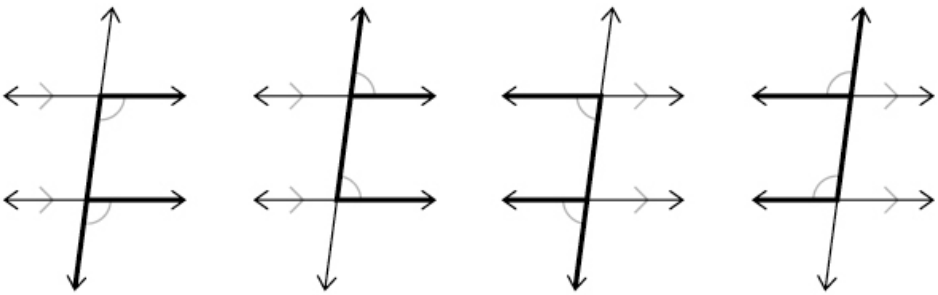


? When a transversal intersects two parallel lines, how are the angle measures related?

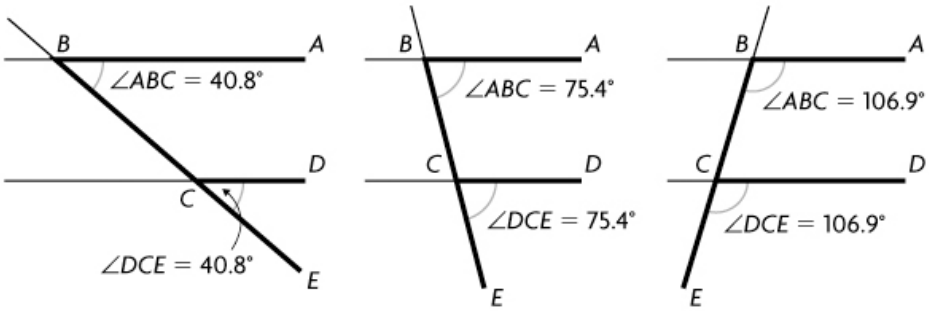
Sample solution

I measured the angle formed by the backboard and the lower adjusting arm. I also measured the angle facing the same direction, formed by the lower adjusting arm and the post. In the first diagram, these angles both measured 132°. In the second diagram, they both measured 70°.

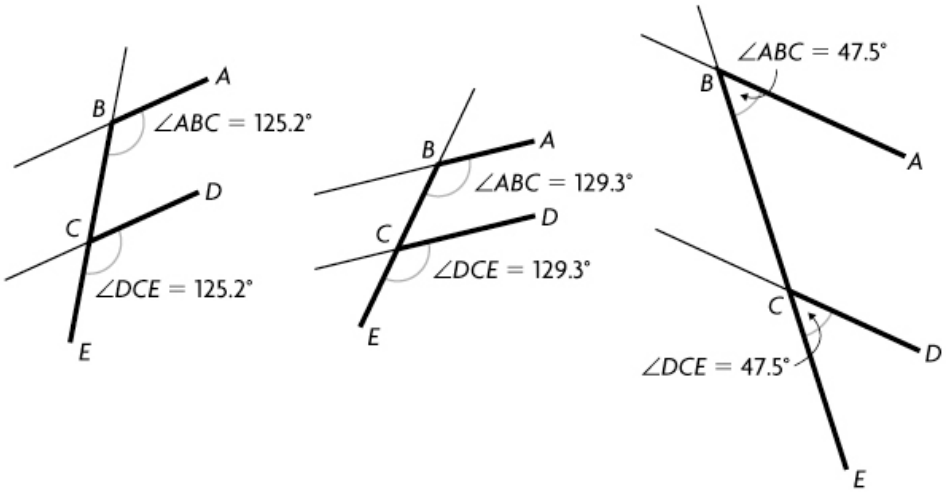
I imagined these angles as forming an F. I conjectured that any angles determined by two parallel lines and a transversal that formed an F would be equal. I drew a sketch of what these angles would look like.



I constructed parallel line segments AB and CD and a transversal using dynamic geometry software. I measured one set of angles that formed an F. Then I moved the transversal to form several different sets of angles and measured the angles. I noticed that no matter how I angled the transversal, the F angles were always equal.

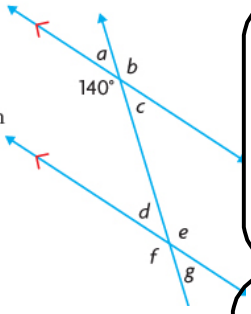


Next, I changed the angle of the parallel line segments and the distance between the parallel line segments. The F angles were still equal.



Reflecting

A. Use the relationships you observed to predict the measures of as many of the angles a to g in this diagram as you can. Explain each of your predictions.



B. Jonathan made the following conjecture: "When a transversal intersects two parallel lines, the **corresponding angles** are always equal." Do you agree or disagree? Explain, using examples.

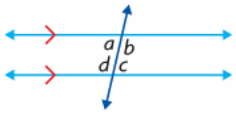
C. Did you discover any counterexamples for Jonathan's conjecture? What does this imply?

D. Sarah says that the **converse** of Jonathan's conjecture is also true: "When a transversal intersects two lines and creates corresponding angles that are equal, the two lines are parallel." Do you agree or disagree? Explain.

E. Do your conjectures about angle measures hold when a transversal intersects a pair of non-parallel lines? Use diagrams to justify your decision.

interior angles

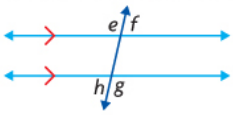
Any angles formed by a transversal and two parallel lines that lie inside the parallel lines.



a, *b*, *c*, and *d* are interior angles.

exterior angles

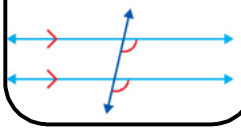
Any angles formed by a transversal and two parallel lines that lie outside the parallel lines.



e, *f*, *g*, and *h* are exterior angles.

corresponding angles

One interior angle and one exterior angle that are non-adjacent and on the same side of a transversal.



converse

A statement that is formed by switching the premise and the conclusion of another statement.

Answers

A.

B.

C.

D.

E.

Notes - Geometry Theorems.doc

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

REVIEW??? GMF 10 - Angle Properties

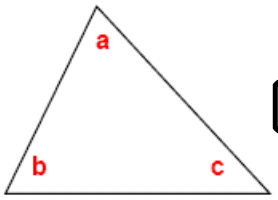
We better do some examples to UNDERSTAND these BIG ideas!!!

Geometry Theorems...

SATT

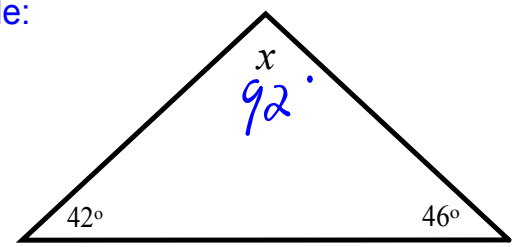
Triangle Angle Sum Theorem:

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



$a + b + c = 180°$

Example:



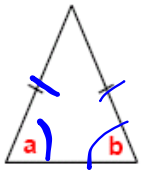
Isosceles Triangle Theorem:

In an isosceles triangle, the base angles are equal.

The two angles that are opposite to the equal sides.

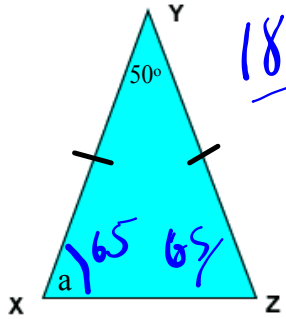
$a = b$

ITT



EXAMPLES...

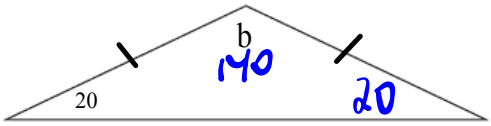
1)



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

165 65

2)



140 20

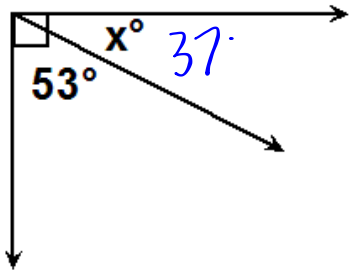
- **Complementary Angles:** CAT

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

Examples:

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

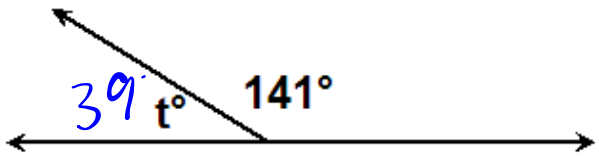
(2) Determine the measure of the missing angle.



- **Supplementary Angles**: (SAT)

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

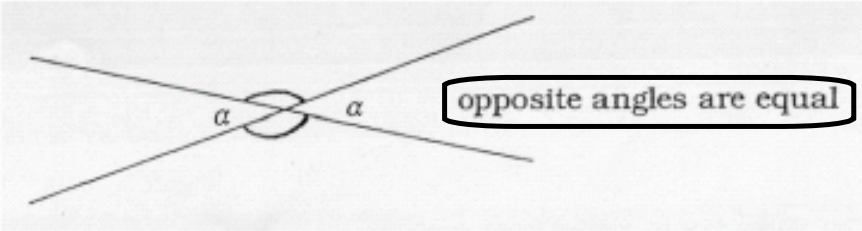
Examples:



Opposite Angle Theorem...

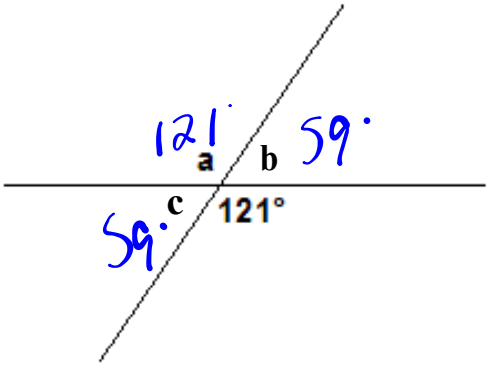
OAT

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



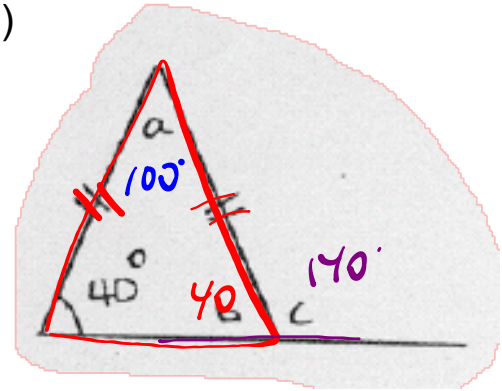
In geometry, angles or lines marked with the same symbol are the same size.

Example:



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

1)



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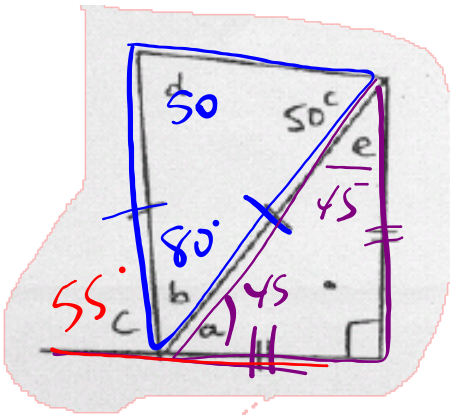
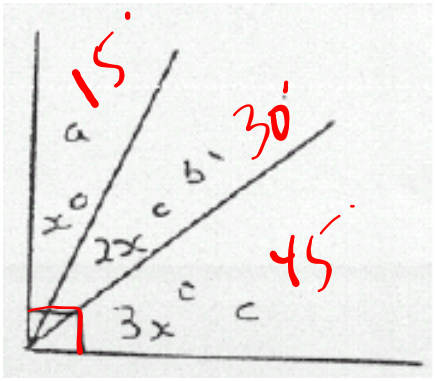


90/2

3)



4)

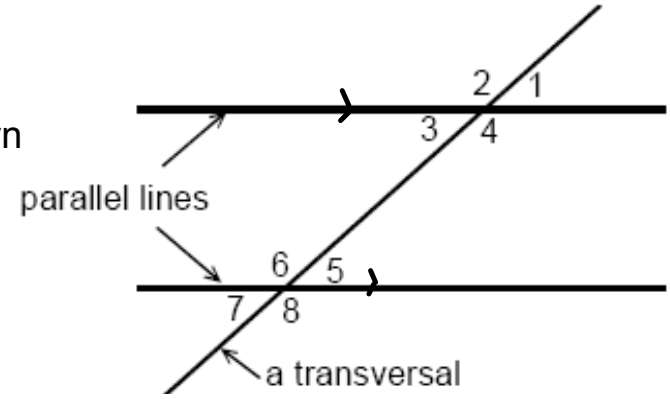
$x + 2x + 3x = 90$

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

$x = 15$

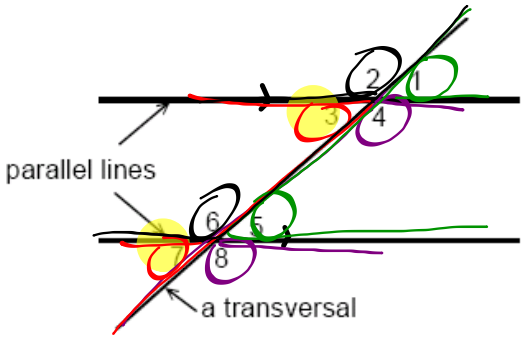
Parallel Line Theorems

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



Corresponding Angles: (CA)

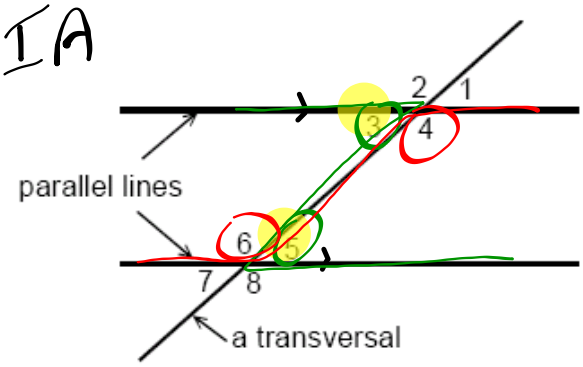
Pairs of angles on the same side of a transversal and the same side of the parallel lines



CORRESPONDING ANGLES ARE EQUAL

Alternate Interior Angles: AIA

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

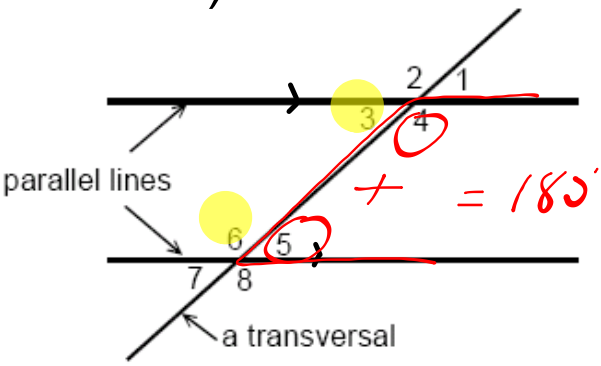


ALTERNATE INTERIOR ANGLES ARE EQUAL

Co-Interior Angles (Same-side Interior):

CIA

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

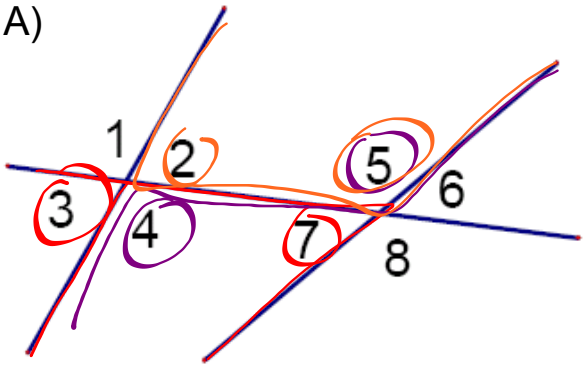


+ = 180°

CO-INTERIOR ANGLES ARE SUPPLEMENTARY

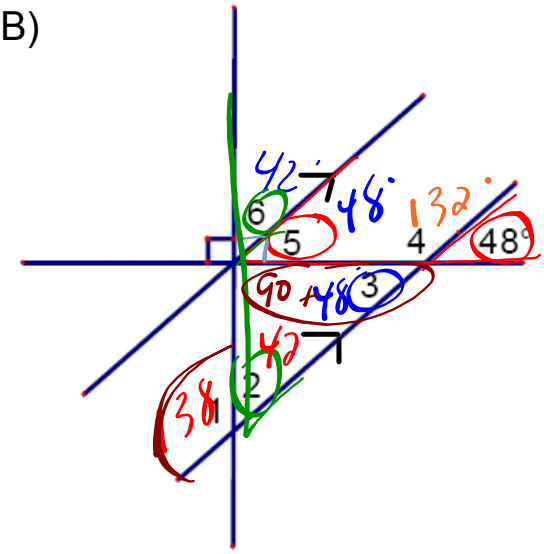
EXERCISE: Practice...

A)



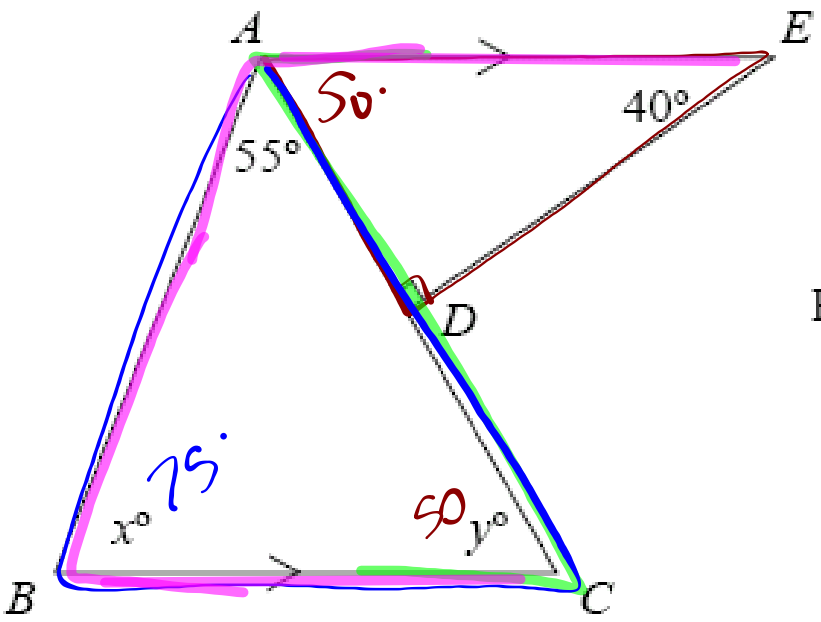
1. <3 and <_____ are corresponding angles. F
2. <4 and <_____ are alternate interior angles. 2
3. <5 and <_____ are same-side interior angles. C

B)



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 $y°$.

HOMEWORK...

Review - Angle Properties.pdf

Attachments

Notes - Geometry Theorems.doc

Review - Angle Properties.pdf