In Summary

Key Idea

- Inductive and deductive reasoning are useful in problem solving.

Need to Know

- Inductive reasoning involves solving a simpler problem, observing patterns, and drawing a logical conclusion from your observations to solve the original problem.
- Deductive reasoning involves using known facts or assumptions to develop an argument, which is then used to draw a logical conclusion and solve the problem.

Questions
2, 6, 1
9, 12, 13

HOMEWORK...

p. 48: #1 - 13
(OMIT #5, 8, 10, 11)

4. a) Substitute numbers for the letters to create an addition problem with a correct answer.

b) How many solutions are possible?

$$\begin{array}{r} y \\ xxx \\ xxx \\ xxx \\ +\ xxx \\ \hline yxxx \end{array}$$

999*4	3996
Ans+3	3999

666*4	2664
Ans+2	2666

333*4	1332
Ans+1	1333

1. Explain which type of reasoning is demonstrated by each statement.

a) Over the past 12 years, a tree has produced plums every other year. Last year, the tree did not produce plums. Therefore, the tree will produce plums this year.

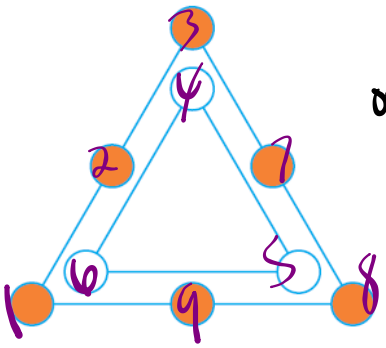
b) Mammals have hair. Dogs are mammals. Therefore, dogs have hair.

c) Every Thursday, a train arrives at 2:30 p.m. Today is Thursday, so the train will arrive at 2:30 p.m.

d) Every even number has a factor of 2. 24 is an even number. Therefore, 24 has a factor of 2.

e) For the pattern 3, 12, 21, 30, 39, the next term is 48.

2. Copy this diagram. Place the digits 1 through 9 in the circles so that the sum of the numbers on the outside triangle is double the sum of the numbers on the inside triangle. Explain whether more than one solution is possible.



1+2+3+4+5+6+7+8+9

=45

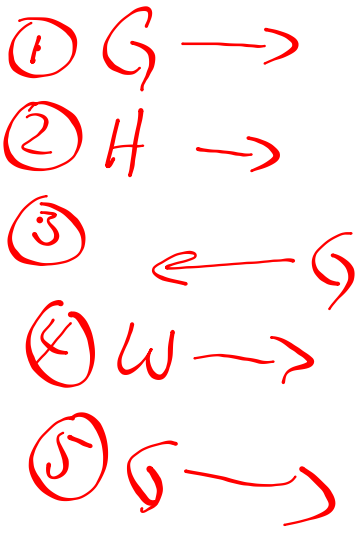
outside

inside

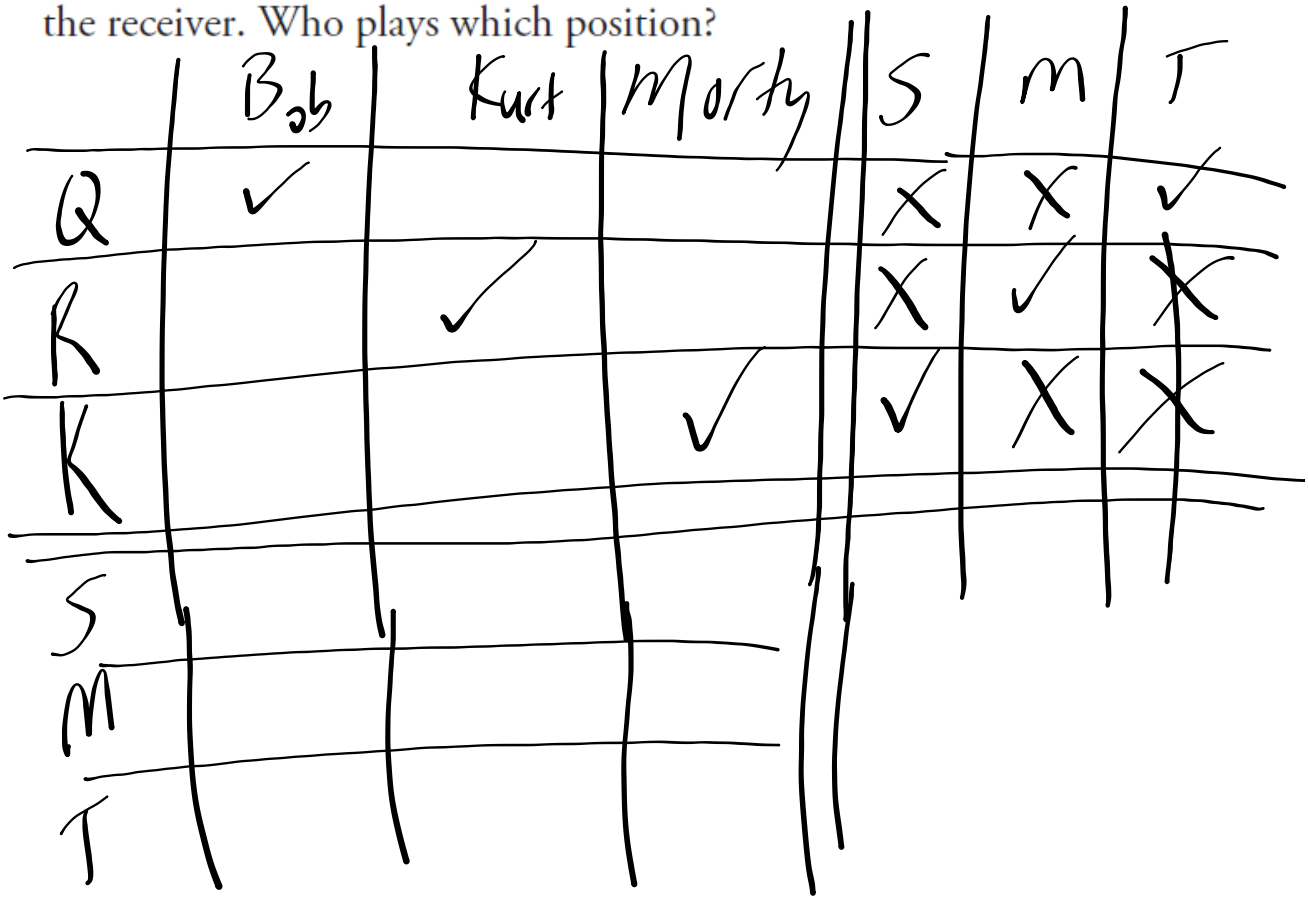
15 + 30

9+1+5

5. A farmer wants to get a goat, a wolf, and a bale of hay to the other side of a river. His boat is not very big, so it can only carry him and one other thing. If the farmer leaves the goat alone with the bale of hay, the goat will eat the hay. If he leaves the wolf alone with the goat, the wolf will eat the goat. When the farmer is present, the goat and the hay are safe from being eaten. How does the farmer manage to get everything safely to the other side of the river?



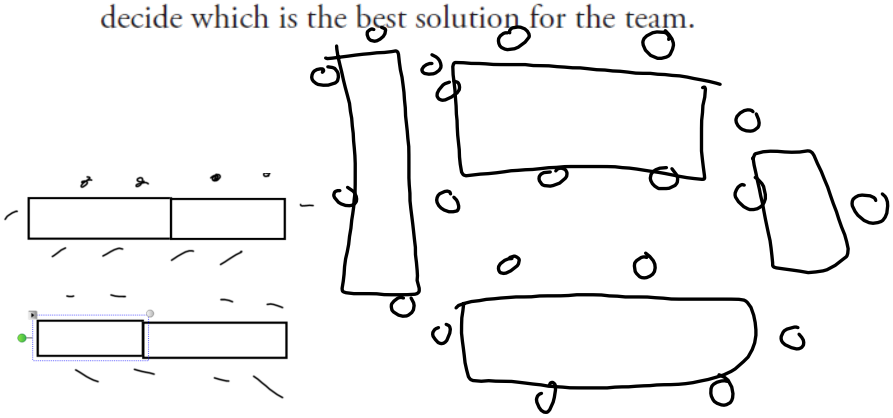
9. Bob, Kurt, and Morty are football players. One is a quarterback, one is a receiver, and one is a kicker. The ~~kicker, who is the~~ shortest of the three, is not married. Bob, who is Kurt's father-in-law, is taller than the receiver. Who plays which position?



12. At lunchtime, a soccer team meets in the school cafeteria to help organize a tournament. There are 18 players and 2 coaches at the meeting. The tables in the cafeteria are rectangular. Two people can sit on each of the long sides, and one person can sit at each end.

a) What arrangement of tables would enable the team members to sit as close to each other as possible, so that everyone can be heard?

b) Compare your solution with other students' solutions. As a group, decide which is the best solution for the team.



WARM UP PROBLEM: Need 4 gallons using only a 3 and 5 gallon jugs???

SOLUTIONS...

there is an alternate way to solve this:

1. fill the 3 gallon jug
2. pour that 3 gallons into the 5 gallon jug
3. refill the 3 gallon jug
4. fill the 5 gallon jug to the top, leaving 1 gallon in the 3 gallon jug
5. empty the 5 gallon jug
6. pour the 1 gallon from the 3 gallon jug into the 5 gallon jug
7. refill the 3 gallon jug
8. pour that 3 gallons into the 5 gallon jug which already has 1 gallon in it for a total of 4 gallons.

Sofia

0

8 times 3 gallon

24

$-5(4)$

4

Step 1. Fill 5 gallon jug

Step 2. Pour 5 gallon jug into 3 gallon jug, leaving 2 remaining gallons in 5 gallon jug.

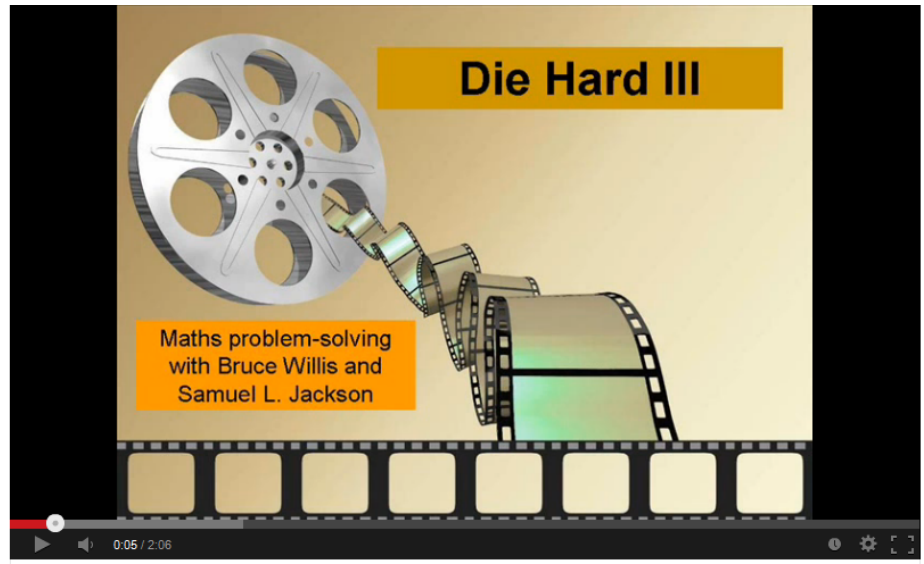
Step 3. Empty 3 gallon jug.

Step 4. Pour 2 gallons from 5 gallon jug into 3 gallon jug, leaving 1 gallon of empty space.

* Die Hard

Step 5. Refill 5 gallon jug.

Step 6. Pour water from 5 gallon jug into 3 gallon jug, which already has 2 gallons in it, and only 1 gallon of empty space, leaving exactly 4 gallons in the 5 gallon jug.



Die Hard III - the water jug problem.

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15 4

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!!!

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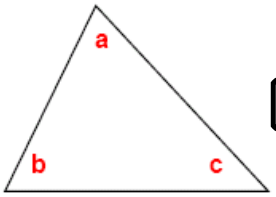
Geometry Theorems...

SATT

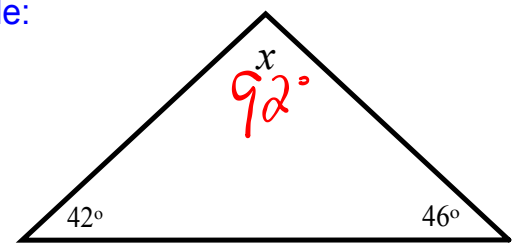
Triangle Angle Sum Theorem:

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



a + b + c = 180°

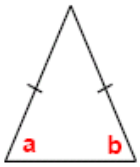
Example:



Isosceles Triangle Theorem:

In an isosceles triangle, the base angles are equal.

The two angles that are opposite to the equal sides.

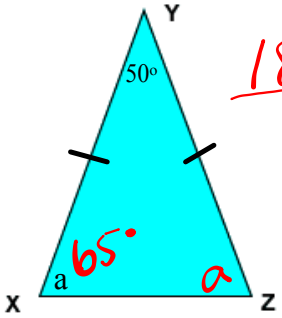


a = b

EXAMPLES...

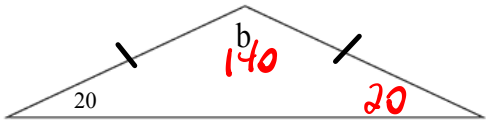
ITT

1)



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

2)

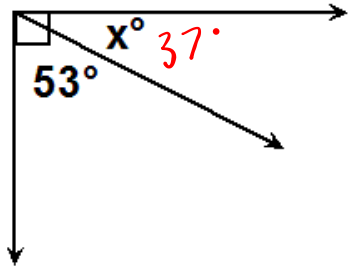


- **Complementary Angles:** CAT
  Two or more angles that have a sum of 90°.

Examples:

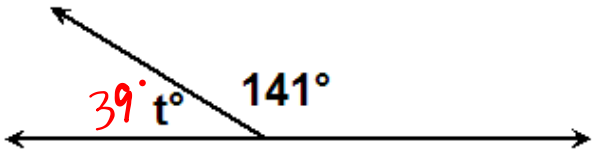
(1) What is the complement of a 50° angle? 40°

(2) Determine the measure of the missing angle.



- **Supplementary Angles**: SAT
  Two or more angles that have a sum of 180°.

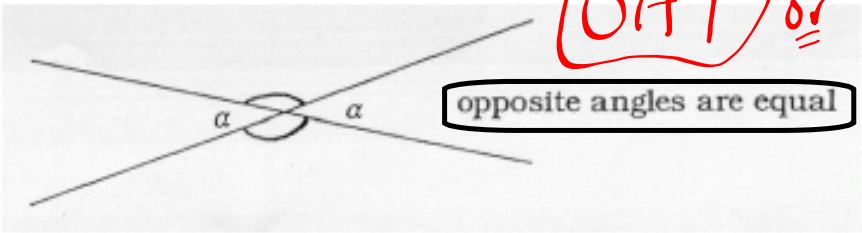
Examples:



Opposite Angle Theorem...

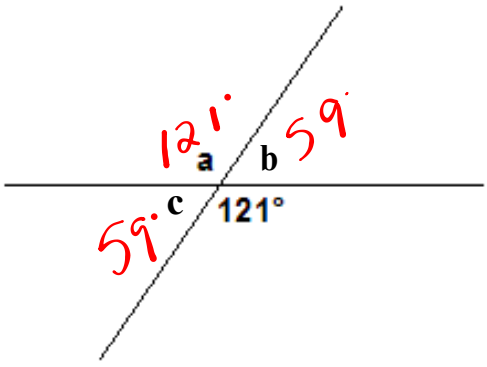
When 2 straight lines cross, 2 pairs of opposite angles are formed. Opposite angles are equal in size

OAT or VOA



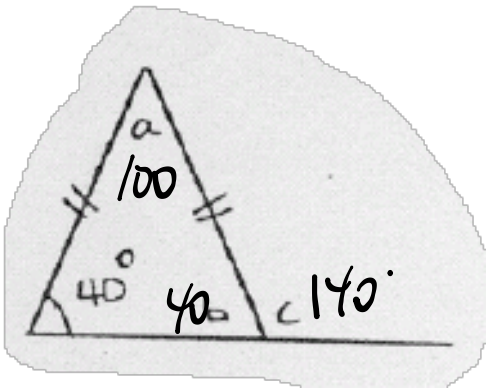
In geometry, angles or lines marked with the same symbol are the same size.

Example:

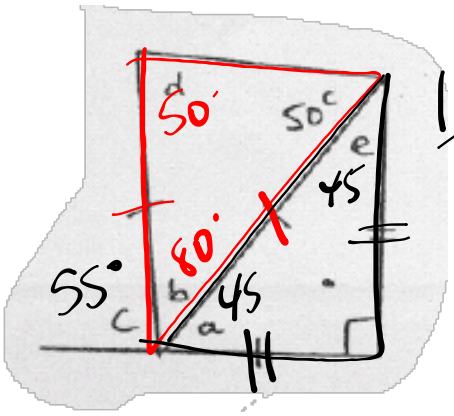


EXERCISE: Use geometry theroems to determine the measure of missing angles...

1)

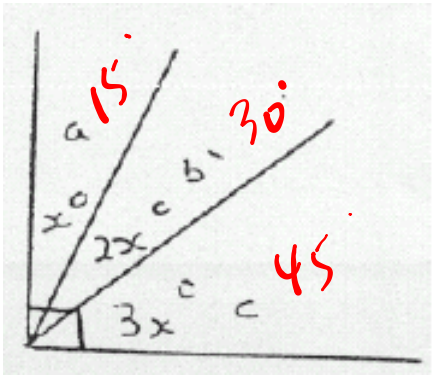


2)



$\frac{180-90}{2}$

3)

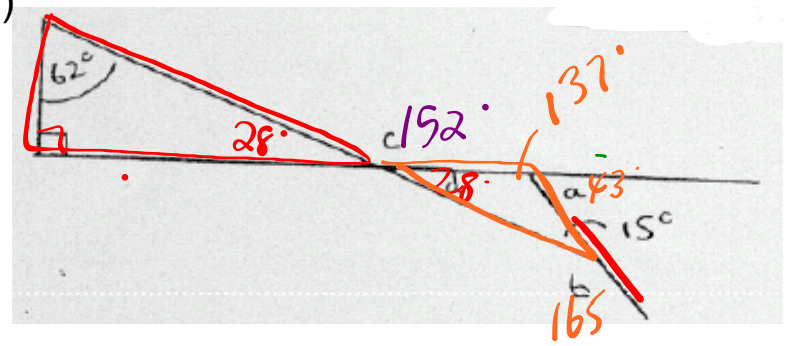


$x + 2x + 3x = 90$

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

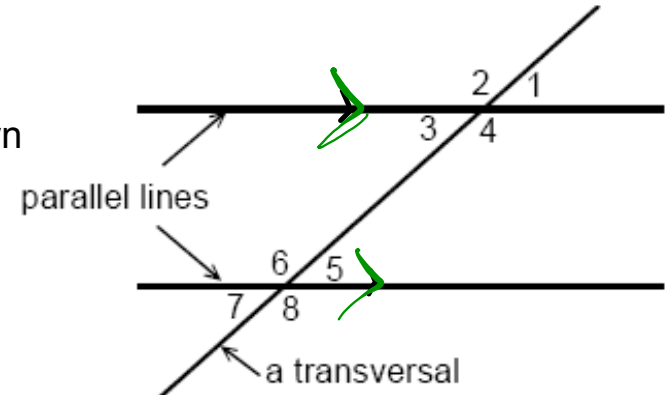
$x = 15°$

4)



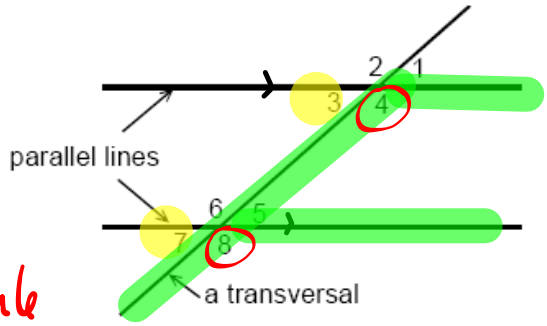
Parallel Line Theorems

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



Corresponding Angles:

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

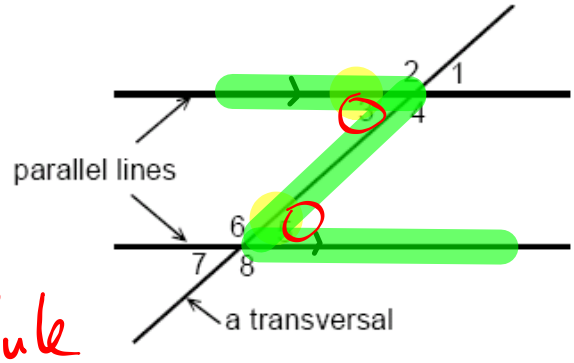


CA -> F Rule

CORRESPONDING ANGLES ARE EQUAL

Alternate Interior Angles:

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

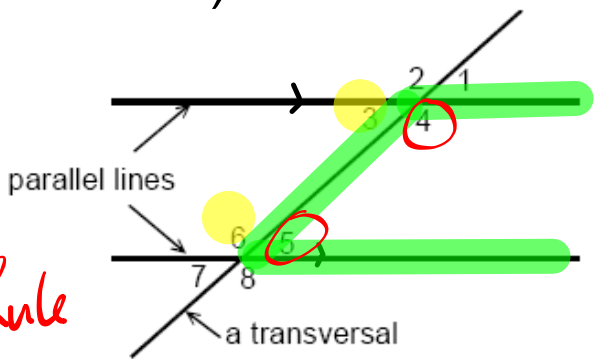


AIA → Z Rule

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



CIA → C Rule

CO-INTERIOR ANGLES ARE SUPPLEMENTARY

Add to 180.

Mr. Svarc's Missing $ Problem...REALLY???

Two men were selling Atlantic Salmon Flies: one man sold 3 flies per dollar and the other man sold 2 flies per dollar.

One day they were both away so they each left 30 flies with a friend. To simplify the reckoning, the friend decided to sell 5 flies for 2 dollars. They sold them all and took in 24 dollars.

When it came to dividing up the sales between the owners...a problem arose. The one who had 30 flies at 3 for a dollar wanted $10. The other who had 30 flies at 2 for a dollar wanted $15. In total this made $25.

The friend only made $24 which means that they are a dollar short.

WHAT HAPPENED TO THE MISSING DOLLAR???

Old MacDonald's Last Wishes...

Old MacDonald had 17 cows. He died. His will said...

The first daughter Malia gets 1/2 of the cows.

The second daughter Lainey gets 1/3 of the cows.

The third daughter Janna gets 1/9 of the cows.

The daughters could not figure out how to divide the cows.

Mr. Hallihan wanted to help so he loaned a cow to them.

Then the first daughter took 1/2 of 18 cows = 9 cows.

The second daughter took 1/3 of 18 or 6 cows.

The third daughter took 1/9 of 18 or 2 cows.

That makes 9 + 6 + 2 = 17 cows. So Mr. Hallihan took his cow back home.

Explain???

Homework...

p. 72: #2

p. 78: #1, 4, 15

Attachments

Notes - Geometry Theorems.doc