TUESDAY, AUGUST 21, 2012

TISK Problems

1. Simplify: $\frac{15}{\sqrt{3}}$

2. Evaluate: $\dfrac{3}{5} \div \dfrac{4}{9}$

3. Simplify: $3\sqrt{90} + 6\sqrt{10} - 2\sqrt{81}$

We will have 3 Mental Math Questions today.

Homework: p. 81 #20-40 evens

HOMEWORK CHECK

15) Sample answer: Points *A*, *B*, and *C* do not lie on a line.

16) *AB* = *EF*

17) Sample answer: *X*, *Y*, *Z*, and *W* are noncollinear.

18) Sample answer: ∡1 and ∡2 have a common side and a common vertex.

19) Sample Answer: Points *R*, *S*, and *T* are collinear.

20) $x > 5$

23) False. Counterexample:
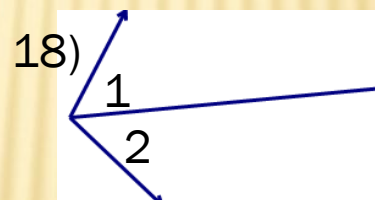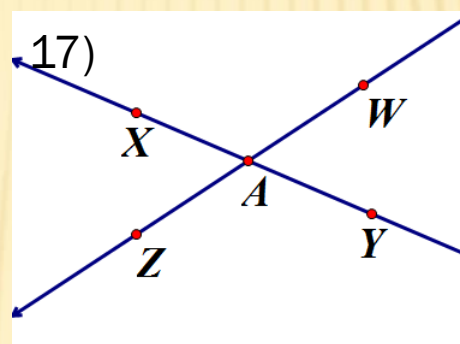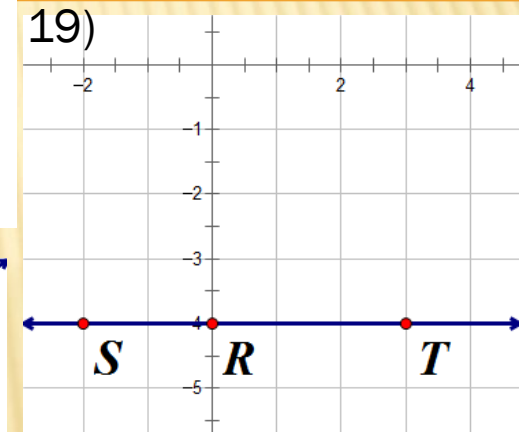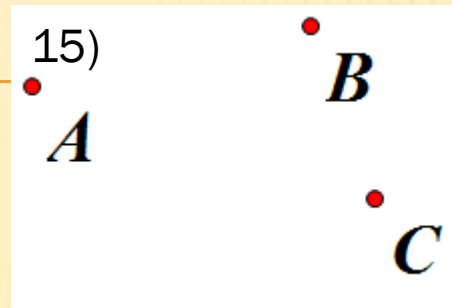
24) true; in any rectangle, the opposite sides have to have the same measures.
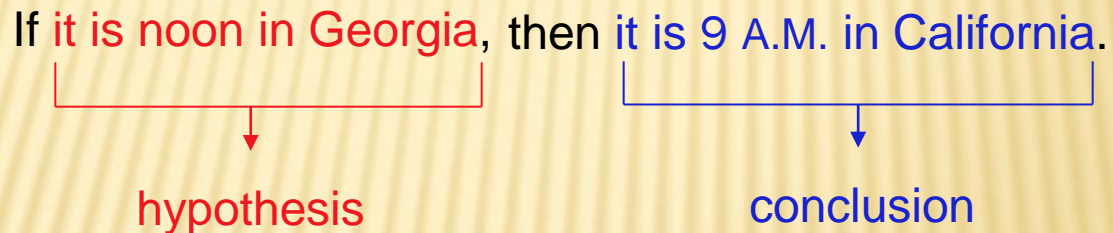
25) false. Counterexample:

26) false; counterexample: If $x = -2$ then $-x = -(-2) = 2$.

15)

19)

17)

18)

23)

25)
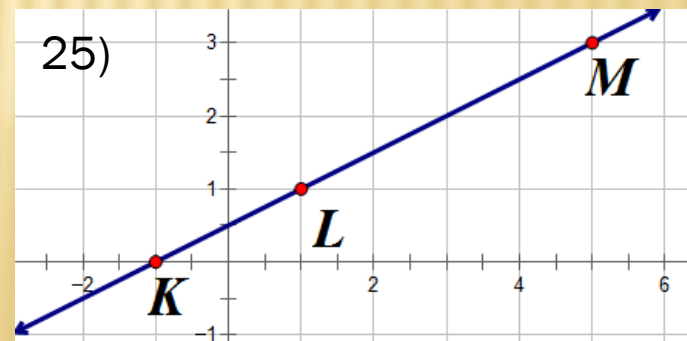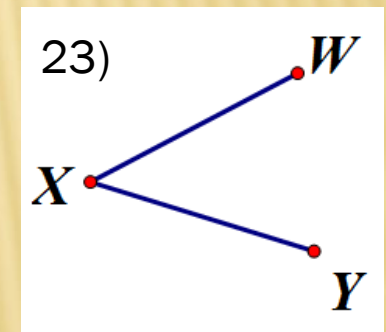
§2.2 CONDITIONAL STATEMENTS

Conditional Statement: A conditional statement has two parts, a *hypothesis* and a *conclusion*.

If-Then Form: the "if" part is the **hypothesis**; the "then" part is the **conclusion**.

If it is noon in Georgia, then it is 9 A.M. in California.

hypothesis   conclusion

Conditional statements can be either true or false.

To show that a conditional statement is true, you must prove that for EVERY POSSIBLE case that satisfies the hypothesis, the conclusion is valid.

To prove that a conditional statement is false, a single counterexample where the hypothesis is true but the conclusion is invalid is enough proof.

WRITE EACH OF THE STATEMENTS IN IF-THEN FORM.

- All ducks are soft.
- The city you visited, Phoenix, is the capital of Arizona.
- On Tuesdays, Ms. McEwen assigns Science homework.

PROVING STATEMENTS WRONG

Write a counterexample to show that the following conditional statement is false.

If $x^2 = 16$, then $x = 4$.

SOLUTION

Think of a case where $x^2 = 16$ There are 2: $x = -4$ and $x = 4$.

However, when $x = -4$, the conclusion is false (if $x = -4$ then it can't $= 4$).

This means the given conditional statement is false.

NOTATION

- We will sometimes use the letters *p* and *q* to stand for hypothesis and conclusion.

- When this is done, the statement can be simplified to: If $p \Rightarrow q$

- This notation helps us to show other types of statements.

CONVERSE

- A converse is what you get when you flip the hypothesis and conclusion of a statement.

- Statement: If $p \Rightarrow q$

- Converse: If $q \Rightarrow p$

- Example: If it is Saturday, then Miss W plays video games.

  - Converse: If Miss W plays video games, then it is Saturday.

INVERSE

- An inverse is obtained by *negating* the hypothesis and the conclusion of the statement.
- Conditional Statement: If $p \Rightarrow q$
- Inverse: If $\sim p \Rightarrow \sim q$
- Example: If it is Saturday, then Miss W plays video games.
  - Inverse: If it is not Saturday, then Miss W does not play video games.

CONTRAPOSITIVE

- A contrapositive is obtained by *negating* the hypothesis and the conclusion of the converse.

- Conditional Statement: If $p \Rightarrow q$

- Contrapositive: If $\sim q \Rightarrow \sim p$

- Example: If it is Saturday, then Miss W plays video games.
  - Contrapositive: If Miss W does not play video games, then it is not Saturday.

TRUTH OF STATEMENTS

× When verifying true conditional statements, there are some links!

  + If the original statement is true, its contrapositive will also be true.

  + If the converse of a statement is true, its inverse will also be true.

TRY IT OUT...

✖ For each statement, do the following:

a) Rewrite as a conditional statement.

b) Determine if it is true.

c) Determine which of the other statements (inverse, converse, contrapositive) are also true.

Statement 1: All CPA 9th Grade students wear black socks.

Statement 2: A student who earns 95% has an A.

Statement 3: All lines contain at least two rays.

Statement 4: For every integer value of x less than 4, x is an integer.

HOMEWORK

- p. 81 #20-40 evens
  - Yes, there is a lot of writing on this assignment.
  - If you would prefer to type it, you may do so.