Conditional Statements

IF you build it...THEN they will come.

Conditional Statements express a cause and effect relationship in the form IF p THEN q. An example of a cause and effect relationship would be like this: When you do your homework your grades get better. To write this as a conditional statement you would write: IF you do your homework THEN your grades will get better. What's the difference you ask? Well nothing, but when you don't have the IF and THEN it can be confusing sometimes what the cause is and what the effect is. Like this: Alternate interior angles are congruent when you have parallel lines cut by a transversal. This is cause and effect too, but it's written backwards. "IF" and "THEN" standardize everything so it's easier to deal with. (We will be using these later to do different things with the rules of logic.) So, to re-write it with "IF" and "THEN" it would go like this: IF parallel lines are cut by a transversal THEN alternate interior angles are congruent.

Here are a few more examples...
Write each as a conditional statement.
Whenever Amy goes to the store she buys milk.

If Amy goes to the store then she buys milk.

Angles are supplementary because they add to 180°.

If two angles add to 180° then they are supplementary.

2x=4 when x=2.

If x=2 then 2x=4.

Note: the words "when," "whenever," "because," "after," "every time," "each" and others often give away the hypothesis of statements not in conditional form. This can help you find it on the tricky ones.

Hypothesis and conclusion

Hypothesis: The part of the conditional statement that follows the "IF" (the cause) labeled "p".

Conclusion: The part of the conditional statement that follows the "THEN" (the effect) labeled "q".

Check this out... Identify the hypothesis p and conclusion q of the following conditional statements:
If an angle is obtuse then its measure is between 90° and 180°.

p hypothesis

q conclusion

If an animal is a dog then it has a tail.

p hypothesis

q conclusion

If a quadrilateral is regular then it is a square.

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Write each statement as a conditional statement.

1. Every time you practice you gain more skill.
2. When you click on a hyperlink you go to a new web page.

3. You get presents whenever it is your birthday.
4. Two lines are perpendicular when they intersect at right angles.

5. You will go to jail every time you drink and drive.
6. Two angles are always equal when they are vertical.

7. People will think you are smart because you know how to use logic.
8. When there are parallel lines cut by a transversal, consecutive angles are supplementary.

9. The diagonals of a rhombus always bisect each other.
10. A can of soda will go flat every time you leave it open.

11. When two sides of a right triangle are 3in and 4in the hypotenuse is 5in.
12. All healthy dogs have four paws.

13. The area of all triangles is the base times the height divided by two.
14. The perimeter of a figure is 4 times its side length when it is a square.

15. Isosceles triangles have two equal sides and two equal angles.
16. From a single point on a line only one perpendicular line can be drawn.

17. Two triangles are congruent whenever all three sides of one are the same lengths as all three from the other.
18. When you steal vegetables from farmer Maggot he will chase after you.
Read the statement, then the phrase. Bubble A if the phrase is the hypothesis, or B if it is the conclusion.

1. If you build it then they will come.
   you build it

2. If a moth eats your shirt then your shirt will have holes.
   your shirt will have holes

3. If two lines in a plane are parallel then they will not intersect.
   they will not intersect

4. If a triangle has a right angle then it is a right triangle.
   a triangle has a right angle

5. If you fill your sink with water then you can wash the dishes.
   you can wash the dishes

6. If a quadrilateral is a trapezoid then it has one pair of parallel sides.
   a quadrilateral is a trapezoid

7. If you feed your turtle then it will grow.
   you feed your turtle

8. If an angle measures $24^\circ$ then it is acute.
   it is acute

9. If a square is inscribed in a circle then a diagonal of the square is a diameter of the circle.
   a square is inscribed in a circle

10. If you are fish then you live in the water.
    you are a fish

11. If two angles are complementary then their sum is $90^\circ$.
    their sum is $90^\circ$

12. If two angles are supplementary then their sum is $180^\circ$.
    their sum is $180^\circ$

13. If two lines intersect then they only intersect in one point.
    they only intersect in one point

14. If you like Star Trek then you are a treky.
    if you like Star Trek

15. If you are reading a book on antigravity then you can't put it down.
    you can't put it down

16. If you are a fish with no eyes then you are a fsh.
    you are a fish with no eyes

17. If you used to be a doctor then you lost your patients.
    you lost your patients

18. If a figure has seven sides then it is a heptagon.
    it is a heptagon