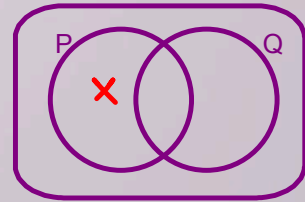


Math 1030 #2b

Analyzing Arguments

Testing Validity



Conditional Statement:

If p, then q
 p and q are phrases
 p is called the hypothesis
 q is called the conclusion

$p \Rightarrow q$ (if p, then q)
 (p implies q)

ex p = dog a pregnant

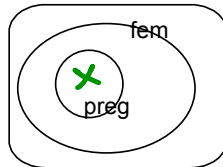
q = dog is female
 if p, then q.

Four Basic Conditional Arguments

(1) Affirming the hypothesis

premises
 conclusion

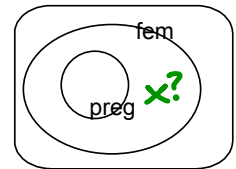
if p then q
 p is true
 q is true



valid
 know: dog is pregnant
 \Rightarrow female \checkmark

(2) Affirming the conclusion

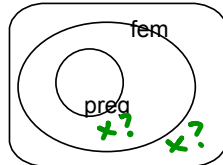
if p then q) P
 q is true)
 p is true) C



invalid
 know: dog is female
 \Rightarrow dog is pregnant? NO!

(3) Denying the hypothesis

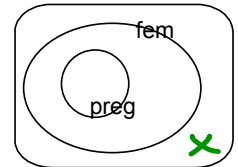
P (if p then q
 p is not true)
 C (q is not true)



invalid
 know: dog is not
 pregnant
 \Rightarrow dog is not female?
 NO

(4) Denying the conclusion

valid
 if p then q) P
 q is not true)
 p is not true) C



know: dog is not
 female
 \Rightarrow dog not pregnant
 yes \checkmark

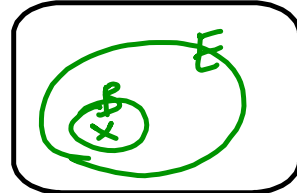
EX 1:

Categorize these arguments and state whether they are valid.

- a) p: If it is a bird, the young hatch from eggs.
p: Condors are birds.

c: Condor chicks are hatched from eggs.

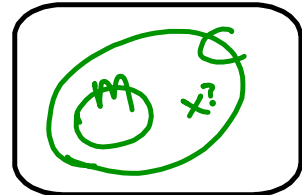
valid
(affirming hypothesis)



- b) p: If we can put a man on the moon, we can build a working computer system.
p: We can build a computer operating system that works.

c: We can put a man on the moon.

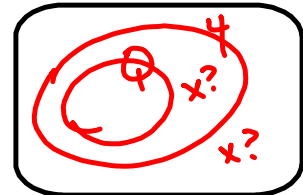
invalid
(affirming conclusion)



- c) p: If a figure is a quadrilateral, it has four sides.
p: Triangles are not quadrilaterals.

c: Triangles do not have four sides.

invalid
(denying hypothesis)



- d) p: If you get at least a C in your math class, you may drive my car.
p: You are not driving my car

c: You did not get a C in math.

Valid
(denying conclusion)

