

Five Easy Exercises with Conjunctions and Disjunctions

1. Bananas and grapes are on sale. Apples are not on sale. So apples are not bananas and grapes.
2. Ice water is cool and refreshing. This isn't refreshing, so it must not be ice water.
3. Jack and Jill went up the hill. No one going up the hill was naked. So Jack wasn't naked.
4. Cheating on exams is foolish and self-destructive. Rizak is foolish, so Rizak cheats on exams.
5. Oregon, USC, or Cal is bound to win the Pac-10 this year. Stanford is no USC, so Stanford won't win the Pac-10.

Five Challenging Exercises with Conjunctions and Disjunctions

6. Sticks and stones will break my bones. But pillows aren't stones. So will they break my bones? And branches are sticks. Will they break my bones?
7. Nothing hurts except sticks and stones. Ow! That hurt. It must have been a stick or a stone.
8. Their weapons are sticks and stones. Sticks aren't deadly weapons. So their weapons aren't deadly.
9. That woman is skinny as a stick and stoned out of her mind. Anyone that skinny is glamorous. So that woman must be glamorous.
10. Two of the most important courses you'll take at SJSU are composition and critical thinking. And this is a critical thinking class. So it must be one of the two most important courses.

(Answer key on next page)

Answer Key:

1. “Bananas and grapes are on sale. No apples are on sale. So no apples are bananas or grapes.” Valid. Notice how, when we move the “no” in front of the conjunction, it changes to a disjunction: Apples are not bananas or grapes, or Apples are neither bananas nor grapes.
2. “Ice water is cool and refreshing. No this is refreshing, so no this is ice water.” Valid, as long as “not refreshing” negates the Y term, “cool and refreshing.” The rule for a conjunction is “negate one, affirm all,” so negating one, “refreshing,” negates Y, making this valid.
3. Jack and Jill are hill-climbers. No hill-climber is naked. So no Jack is naked.” Passes all three rules, so the conclusion here could be: “so no Jack or Jill is naked,” or “so no Jack and no Jill is naked.” But you don’t need to state both parts of the conjunction, because if “no Jack and no Jill is naked” is true, then certainly “no Jack is naked” and “no Jill is naked” would be true separately.
4. “Cheating on exams is foolish and self-destructive. Rizak is foolish, so Rizak cheats on exams.” Invalid. We don’t even have to worry about the conjunction, because even if affirming “foolish” affirms “foolish and self-destructive” (which it doesn’t – “affirm all” is the rule for an “and”), the middle term here, “foolish,” isn’t distributed in either premise.
5. “Oregon, USC, or Cal is winner. No Stanford is USC, so no Stanford is winner.” For an “or,” the rule is, “affirm one, negate all.” But here, “No Stanford is USC” negates only one of the three parts of the disjunction. So the X term of the first premise has not been negated, and we can’t conclude anything about whether Stanford will win the Pac-10.
6. “No pillow is stone, so no pillow is bone-breaker” would be invalid because “bone-breaker” is distributed in the conclusion and not the premise. “All branches are sticks, so all branches are bone-breakers” would be valid, except that the X term is “sticks and stones” and “all branches are sticks” only affirms one of those, so this too is invalid.
7. This one is a little difficult, because you have to ask yourself how to put “nothing hurts except sticks and stones” into one of the forms of a claim. It sounds negative, but it is actually a double negative (“nothing ... except ...”). So this becomes “All hurting things are sticks or stones.” Notice that taking the negative away changes the “and” to an “or.” So the rest of the argument is “Z is a hurting thing, so Z is a stick or a stone.” So that’s valid.
8. “Their weapons are sticks and stones. No sticks are deadly. So no weapons are deadly.” The form is valid, as long as “no sticks” negates the Y term, “sticks and stones.” Does it? The rule for an “and” is negate one, affirm all, and “no sticks” negates one, so this is valid.
9. “Woman is skinny and stoned. All skinny are glamorous. So woman is glamorous.” Valid as long as affirming “skinny” affirms the Y term, “skinny and stoned.” But you need to affirm all for an “and” phrase, and we’ve only affirmed one here, so this is not valid. It would be, though, if the first premise were “That woman is skinny as a stick or stoned out of her mind.” Then saying “all skinny are glamorous, so woman is glamorous,” would be valid.
10. How would you put “Two of the most important courses you’ll take at SJSU are composition and critical thinking” into the form of a claim? Would it be “All important courses are composition and critical thinking”? That doesn’t mean the same thing. So it must be “Composition and critical thinking are important courses.” If so, then saying “This is critical thinking, so it must be an important course.” Because the conjunction is the X term of the argument, you are saying they are both important courses – that is, that composition is an important course, and that critical thinking is an important course. If that’s true, then we can certainly conclude that critical thinking is an important course.