

Sample Solutions to Translating from Predicate Logic

Instructions: Use the given interpretations to translate the following arguments written in predicate logic into natural, English sentences.

Ax: "x is an athlete"
Bx: "x is brawny"
Cx: "x is a champion"
m: "Mary"
g: "Gail"
n: "Ned"

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|----|--|--------------------------------|---|
| 1. | 1. $(\forall x)(Ax \supset Bx)$
2. $Am \bullet An$ | / $Bm \bullet Bn$ | 1. All athletes are brawny. Mary and Ned are athletes. So, Mary and Ned are brawny. |
| 2. | 1. $(\forall x)(Ax \supset Bx)$
2. $(\forall x)(Bx \supset Cx)$ | / $(\forall x)(Ax \supset Cx)$ | 2. All athletes are brawny. Everything brawny is a champion. Therefore, all athletes are champions. |
| 3. | 1. $(\forall x)(Bx \supset Cx)$
2. $(\exists x)(Ax \bullet Bx)$ | / $(\exists x)(Ax \bullet Cx)$ | 3. Everything that's brawny is a champion. There are some brawny athletes. So, there are some athletic champions. |
| 4. | 1. $(\forall x)(Ax \supset Bx)$
2. $\sim Bm$ | / $(\exists x)\sim Ax$ | 4. All athletes are brawny. Mary isn't brawny. So, something isn't an athlete. |
| 5. | 1. $(\forall x)[Ax \supset (Bx \vee Cx)]$
2. $Ag \bullet \sim Bg$ | / Cg | 5. All athletes are either brawny or champions. Gail is an athlete, but she isn't brawny. So, Gail is a champion. |
| 6. | 1. $(\forall x)[(Ax \bullet Bx) \supset Cx]$
2. $(\exists x)(Bx \bullet \sim Cx)$ | / $(\exists x)\sim Ax$ | 6. All brawny athletes are champions. Some brawny things aren't champions. So, something isn't an athlete. |
| 7. | 1. $(\exists x)Ax \supset (x)(Cx \supset Bx)$
2. $(\exists x)(Ax \vee Bx)$
3. $(\forall x)(Bx \supset Ax)$ | / $(\forall x)(Cx \supset Ax)$ | 7. If something is an athlete, then all champions are brawny. Something is either an athlete or brawny. All brawny things are athletes. So, all Champions are athletes. |