Symbolization and Translation Exercises (Solutions)
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1. Symbolize each of the following English sentences:
   a. Some zebras are not mammals. \((\exists x)(Zx \land \neg Mx)\)
   b. Something is orange. \((\exists x)Ox\)
   c. All boxes are sturdy. \((x)(Bx \supset Sx)\)
   d. Everything is blue. \((x)Bx\)
   e. Some tigers are lions. \((\exists x)(Tx \land Lx)\)
   f. Nothing is red. \((x)\neg Rx\)
   g. Something is not purple. \((\exists x)\neg Px\)
   h. No sores are gangrenous. \((x)(Sx \land \neg Gx)\)

2. Translate the following symbolized expressions into English:
   a. Tk (Keith is tall)
   b. Dx (_____ is a dog)
   c. (x)Cx (Everything is cool)
   d. (\exists x)(Wx \land Kx) (Some Wisconsinites are killers)
   e. \Phi x (_____ is _____)
   f. (\exists x)Lx (Something is laconic)
   g. (x)(Ex \land Fx) (All elephants are fabulous)
   h. Mn (Nick is a Moonie)
   i. (x)(Gx \land \neg Hx) (No giraffes are hilarious)
   j. (x)\neg Zx (Nothing is a zebra)
   k. (\exists x)Ox (Something is outrageous)
   l. \Phi r (Ralph is _____)
m. (Ǝx)~Sx (Something is not sad)

n. (Ǝx)(Tx • ~Bx) (Some tyrants are not bitter)

Which of your translated propositions are true and which false? Which are neither true nor false?

3. Additional translations:

a. (x)Ax ⊃ (x)Bx (If everything is an apple, then everything is a banana)

b. (x)Cx ⊃ (Ǝx)Dx (If everything is a cat, then something is a dog)

c. (x)Ex ⊃ Fm (If everything is an elephant, then Mark is fat)

d. (Ǝx)Gx ⊃ (x)Hx (If something is a giraffe, then everything is a horse)

e. (Ǝx)Ix ⊃ (Ǝx)Jx (If something is intransigent, then something is juvenile)

f. (Ǝx)Kx ⊃ Lt (If something is a Kansan, then Tim is a lieutenant)

g. Me ⊃ (x)Nx (If Edward is married, then everything is naked)

h. Oe ⊃ (Ǝx)Px (If Ernie is obese, then something is poor)

i. Qe ⊃ Rf (If Edgar is a quartermaster, then Frances is religious)

j. [(x)Sx • (Ǝx)Tx] ⊃ Uk (If everything is small and something is tall, then Karen is unpopular)

k. (Ǝx)Vx v (Ǝx)Wx (Either something is virtuous or something is wicked)

l. (x)Xx ≡ ~(Ǝx)~Yx (Everything is a xylophone if and only if it’s not the case that something is not yellow)
m. \((Zc \lor Ad) \supset (Za \lor Ag)\) (If either Carl is a zebra or David is an accountant, then either Andre is a zebra or Georgia is an accountant)

n. \((x)(Bx \supset Cx)\) (All bazookas are contraband)

o. \((x)(Dx \supset Ex) \lor Fn\) (Either all dogs are elephants or Nick is a freak)

p. \((\exists x)(Gx \land Hx) \supset (x)(Ix \supset \neg Jx)\) (If some goofballs are happy, then no insane people are jealous)

q. \((x)Kx \supset (x)(Kx \supset Lx)\) (If everything is a Kentuckian, then all Kentuckians are lazy)

r. \((\exists x)Mx \lor (\exists x)(Nx \land \neg Ox)\) (Either something is married or some neighbors are not orthodox)

s. \[Px \lor (x)Qx\] \supset [(\exists x)(Rx \land Sx) \equiv Ts] (If either Xavier is poor or everything is quiet, then some rabbits are snakes if and only if Susie is a tarantula) (Note: I should not have used “x” in “Px”; I should have used, say, the letter “a”)

t. US \land \neg (x)Vx (Stillmon is unmarried and it’s not the case that everything is valuable)

u. WR \supset (Xo \lor Yi) (If Rachel is wrong, then either Oliver is an x-ray or Ivan is a Yalie)

v. \((x)Zx \supset (\exists x)Zx\) (If everything is a Zanzibarian, then something is a Zanzibarian)