

Worksheet Exercise 4.4.D.
Quantificational Deductions

Name _____
 Class _____ Date _____

Part D, 11-15. Symbolize the following arguments in the spaces provided, and give deductions for them. Check the symbolization answers at the end. These problems are more difficult—practice them first. Try to write a little smaller here to make things fit.

(11) Dogs are large animals suitable as pets. All large animals are potentially dangerous. So, dogs are potentially dangerous yet suitable as pets. (D, L, A, S, P)

(12) If all dogs are potentially dangerous, then they all require insurance. Fido requires no insurance; but Fido does bark; and only dogs bark. So, some dogs are not potentially dangerous. (D, P, R, f, B)

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(13) Some dogs are wimpy; and, some cats are ferocious. Wimpy things don't put up a fight; and, ferocious things don't back down. So, both some dogs don't put up a fight, and some cats don't back down. (D, W, C, F, P, B)

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(14) Betsy can't sing. But some can sing and climb mountains too. Others can't climb mountains, but they can dance. Now, if both singers and dancers exist, then no non-dancing non-singers exist. So, Betsy can't sing, but she can certainly dance. (b, S, M, D)

(15) All kittens are felines. All felines are whiskered animals. If all kittens are whiskered, then all felines are carnivores. All carnivorous animals are predators. So, all kittens are predators. (K, F, W, A, C, P)

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Some help: Here is how you symbolize these arguments. Of course, you have to give the deductions too.

(11) $(\forall x)[Dx \supset ((Lx \ \& \ Ax) \ \& \ Sx)]$, $(\forall x)[(Lx \ \& \ Ax) \supset Px]$ ∴ $(\forall x)[Dx \supset (Px \ \& \ Sx)]$

(12) $(\forall x)(Dx \supset Px) \supset (\forall x)(Dx \supset Rx)$, $\sim Rf$, Bf , $(\forall x)(Bx \supset Dx)$ ∴ $(\exists x)(Dx \ \& \ \sim Px)$

(13) $(\exists x)(Dx \ \& \ Wx)$, $(\exists x)(Cx \ \& \ Fx)$, $(\forall x)(Wx \supset \sim Px)$, $(\forall x)(Fx \supset \sim Bx)$
 ∴ $(\exists x)(Dx \ \& \ \sim Px) \ \& \ (\exists x)(Cx \ \& \ \sim Bx)$

(14) $(\exists x)(Sx \ \& \ Mx)$, $(\exists x)(\sim Mx \ \& \ Dx)$,
 $[(\exists x)Sx \ \& \ (\exists x)Dx] \supset \sim(\exists x)(\sim Dx \ \& \ \sim Sx)$ ∴ $\sim Sb \ \& \ Db$

(15) $(\forall x)(Kx \supset Fx)$, $(\forall x)[Fx \supset (Wx \ \& \ Ax)]$, $(\forall x)(Kx \supset Wx) \supset (\forall x)(Fx \supset Cx)$,
 $(\forall x)[(Cx \ \& \ Ax) \supset Px]$ ∴ $(\forall x)(Kx \supset Px)$