

PROBLEM 1 *Symbolizing*

For each of the following, convert from text to symbolic logic. Some are known, named truths (we included the name for fun); others are false. The first one is done for you.

Celarent No G are F. All H are G. So: No H are F

$\nexists x . G(x) \wedge F(x)$ or $\forall x . G(x) \rightarrow \neg F(x)$, or $\forall x . \neg(G(x) \wedge F(x))$, or equivalent

$\forall x . H(x) \rightarrow G(x)$ or equivalent

$\therefore \nexists x . H(x) \wedge F(x)$ or equivalent

Barbara All G are F. All H are G. So: All H are F

Ferio No G are F. Some H is G. So: Some H is not F

(false) All G are F. No H is not G. So: Some H is not F

- No G are F. All H are G. So: No H are F

- No G are F. Everything is F. So: Nothing is G

- All G are F. Something is G. So: Some G is F

Want more practice? Try Practice exercises $\forall x$ 22.A (pages 187–188)

PROBLEM 2 *Symbolizing with a Key*

Using this symbolization key:

domain: all animals

$A(x)$: ---_x is an alligator

$M(x)$: ---_x is a monkey

$Z(x)$: ---_x lives at the zoo

$L(x, y)$: ---_x loves ---_y

f : Fluffy

s : Slick

h : Howler

Symbolize each of the following sentences; the first one is done for you.

If both Slick and Howler are alligators, then Fluffy loves them both.

$$(A(s) \wedge A(h)) \rightarrow (L(f, s) \wedge L(f, h))$$

Any animal that lives at the zoo is either a monkey or an alligator.

Howler loves a monkey.

All the monkeys that Fluffy loves love Fluffy.

Everyone Slick loves loves some animal other than Slick.

Every animal in the zoo's love is outside the zoo, and vice versa.

If both Slick and Howler are alligators, then Fluffy loves them both.

There are no monkeys at the zoo.

Slick loves every animal that loves Slick.

Fluffy and Howler don't love any of the same animals.

Slick loves exactly one animal.

Want more practice? Try Practice exercises $\forall x$ 22.B (page 188) and $\forall x$ 23.A–F (pages 199–203).