



3. Use the letter  $t$  to represent the statement Bill is tall,  $d$  for Bill is dark, and  $h$  for Bill is handsome. Use these names along with the basic logic operations to write each of the following English sentences in symbolic logic notation:

- (a) Bill is tall, dark, and handsome.
- (b) Bill is tall and dark, but not handsome.
- (c) Either Bill is tall or he is handsome, but not both.
- (d) Bill is neither tall nor handsome.

4. Use the phrases in the previous exercise to write an English statement equivalent to each of the following propositions:

- (a)  $(t \vee d \vee h) \wedge \neg(t \wedge d \wedge h)$
- (b)  $\neg t \wedge \neg d$
- (c)  $d \wedge \neg(t \wedge \neg d)$
- (d)  $(t \wedge d) \vee (\neg t \wedge d)$