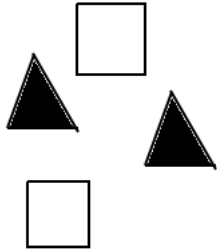


# C241 HW7

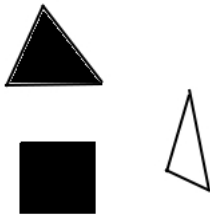
Zac Monroe

October 2018

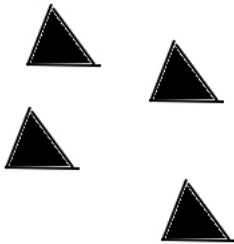
1. (a) Here is my toy model for part (a).



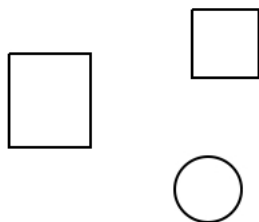
- (b) Here is my toy model for part (b).



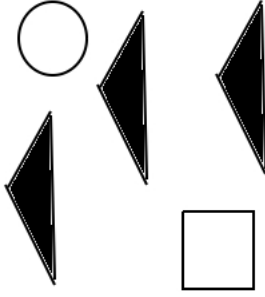
- (c) Here is my toy model for part (c).



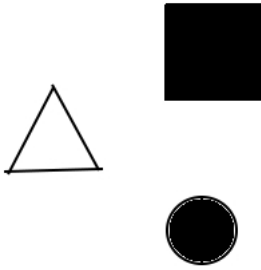
- (d) Here is my toy model for part (d).



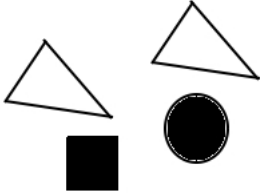
(e) Here is my toy model for part (e).



(f) Here is my toy model for part (f).



(g) Here is my toy model for part (g).



2. (a)  $\forall x E(x)$
- (b)  $\forall x P(x)$
- (c)  $\exists x N(x)$
- (d)  $\exists x E(x)$
- (e)  $\exists x F(x)$
- (f)  $\forall x (P(x) \rightarrow F(x))$
- (g)  $\exists x (E(x) \wedge P(x))$
- (h)  $\exists x (N(x) \wedge E(x))$
- (i)  $\forall x (F(x) \rightarrow E(x))$
- (j)  $\exists x (E(x) \wedge P(x))$
- (k)  $\forall x (E(x) \wedge P(x))$
- (l)  $\neg \exists x E(x)$
- (m)  $\neg \exists x N(x)$
- (n)  $\exists x \neg F(x)$
- (o)  $\neg \forall x P(x)$
- (p)  $\forall x (N(x) \rightarrow \neg F(x))$

- (q)  $\neg\forall(E(x) \rightarrow P(x))$
- (r)  $\neg\exists(E(x) \wedge N(x))$
- (s)  $\forall x(F(x) \rightarrow \neg E(x))$

3. (a) All integers are prime.
- (b) There exists a negative integer.
- (c) All integers are prime and even.
- (d) All integers are either prime or negative.
- (e) All integers greater than five are prime.
- (f) At least one prime integer is even.
- (g) There is at least one integer that is either negative or even.
- (h) All prime integers are non-negative.
- (i) There exists at least one negative integer that is not prime.
- (j) There does not exist a negative integer that is even.