(8.) $I(x)$ = Has a internet connection

$C(x,y)$ / C = Have chatted over the internet

(x,y) = All Students in your class

a.)

$\neg I$

c.)

$\neg C(Ian, Sharon) \wedge \neg C(Sharon, Ian)$

d.)

$\neg \exists x C(x, bob)$

k.)

$\exists x I(x) \rightarrow \forall y \neg C(x,y)$

w.)

$\exists x \forall y (C(x,y))$

(16.)

a.)

$\neg \exists y \exists x P(x,y) \in \forall$

$\equiv \forall y \neg \exists x P(x,y)$ De morgan

$\equiv \forall x \forall y \neg P(x,y)$

b.)

$\neg \forall x \exists y P(x,y) \in \forall$

$\equiv \exists x \neg \exists y P(x,y)$ De morgan

$\equiv \exists x \forall y \neg P(x,y)$

c.)

$\neg \exists y (Q(y) \wedge \forall x \neg R(x,y)) \in \forall$

$\equiv \forall y \neg (Q(y) \wedge \forall x \neg R(x,y))$

$\equiv \forall y (\neg Q(y) \vee \neg \forall x \neg R(x,y))$

$\equiv \forall y (\neg Q(y) \vee \exists x R(x,y))$

$\equiv \forall y (Q(y) \rightarrow \exists x R(x,y))$