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Matdis 2nd Assignment

Ex 1.4

15. a. $\forall n (n^2 \geq 0)$ ... (T)
b. $\exists n (n^2 = 2)$ ... (F)
c. $\forall n (n^2 \geq n)$ ... (T)
d. $\exists n (n^2 < 0)$ ... (F)

Jika $P(x)$ = "x is perfect" & $Q(x)$ = "x is your friends"

25. a. No one is perfect
$\sim \exists x P(x)$

b. Not everyone is perfect
$\sim \forall x P(x)$

c. All your friends are perfect
$\forall x (Q(x) \rightarrow P(x))$

d. At least one of your friend is perfect
$\exists x (Q(x) \wedge P(x))$

e. Everyone is your friend and is perfect
$(\forall x Q(x)) \wedge (\forall x P(x))$

f. Not every body is your friend or someone is not perfect
$(\sim \forall x Q(x)) \vee (\sim \exists x P(x))$

Ex 1.5

27. a. $\forall n \exists m (n^2 < m)$ ... (T)
b. $\exists n \forall m (n < m^2)$ ... (T)
c. $\forall n \exists m (n+m = 0)$ ... (T)
d. $\exists n \forall r (r \cdot m = m)$ ... (T)
e. $\exists n \exists m (n^2 + m^2 = 5)$ ... (T)
f. $\exists n \exists m (n^2 + m^2 = 6)$ ... (F)
g. $\exists n \exists m (n+m = 4 \wedge n-m = 1)$ ... (F)
h. $\exists n \exists m (n+m = 4 \wedge n-m = 2)$ ... (T)
i. $\forall n \forall m \exists p (p = (m+n)/2)$ ... (F)

28. a. $\forall x \exists y (x^2 = y)$ ... (T)
b. $\forall x \exists y (x = y^2)$ ... (F)
c. $\exists x \forall y (xy = 0)$ ... (T)
d. $\exists x \exists y (x+y \neq y+x)$ ... (F)
e. $\forall x (x \neq 0 \rightarrow \exists y (xy = 1))$ ... (T)
f. $\exists x \forall y (y \neq 0 \rightarrow xy = 1)$ ... (T)
g. $\forall x \exists y (x+y = 1)$ ... (T)
h. $\exists x \exists y (x+2y = 2 \wedge 2x+4y = 5)$ ... (F)
i. $\forall x \exists y (x+y = 2 \wedge 2x-y = 1)$ ... (F)
j. $\forall x \forall y \exists z (z = (x+y)/2)$ ... (T)