Rohan Merton Week 4

4.1

	Expression	Formula?	Sentence?
i)	$\forall x (P^1 x \rightarrow Q^1 y)$	✓	x
ii)	$\exists x \neg (\neg\neg \exists y P^1 y \wedge \neg \ldots R^2 x a)$	✓	✓
iii)	P^0	✓	✓
iv)	$\forall x \exists y \exists z (R^3 x y z)$	✓	✓
v)	$\forall x \exists x Q^2 x x$	✓	✓
vi)	$\neg (\neg (\exists x P^1 x \wedge \exists y Q^1 y))$	x	no brackets for $\neg$
vii)	$\forall x (\exists y (P^2 x y \wedge P^1 x) \vee Q^3 x y z)$	✓	x

Free occ. are circled

4.2 i) $\forall x (\forall y (P_4^2 x y \Rightarrow (P_4^2 y x \wedge R^1 x)))$

ii) $\forall x (R^3 x x z \wedge \exists y (R^3 x z x))$

iii) $\neg \forall z_2 (R^2 x z)$

iv) $\forall x (\neg\neg ((P^2 x y \vee R^2 y x) \vee R^2 z y))$

4.3 i) $Pa \wedge Qa$ a: London P: ... is big Q: ... is ugly

ii) ~~$\forall x$~~ Qa a: Culham ~~P: ... is a city~~ Q: ... is a large village

iii) $\forall x (Px \rightarrow \exists y (Qy \wedge Rxy))$ P: ... is a city Q: ... is a city hall R: ... has ...

iv) $\forall x (Px \rightarrow Qx)$ P: ... is a material obj. Q: ... is divisible

v) $\exists x (Px \wedge Rax)$ P: ... is a car R: ... owns ... a: Tom

vi) $\exists x (Px \wedge Rax \wedge R_1 ax)$. As above; R_1: ... will ~~must~~ sell ...

vii) $\exists x (Px \wedge \forall y (Qy \rightarrow Rxy))$ P: ... is a man Q: ... is a country R: ... has visited ...

4.4 i) Tom acts freely ii) Tom acts freely or he's not a person
iii) All people act freely iv) Something acts freely if and only if it's a person
v) Nothing acts freely.

4.5 i) There aren't any sets. ii) Not all sets have elements.
iii) There exists a set with no elements.
iv) There isn't a set of every thing.