

Exercises subst, Basic Logic 2007/08

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November 8, 2007

Determine $\varphi[t/x]$ in each of the following cases of φ, t .

1. φ is $x = x$, t is x ,
2. φ is $x = x$, t is z ,
3. φ is $\forall x(x = x)$, t is z ,
4. φ is $\forall x(z = z)$, t is z ,
5. φ is $\forall z(x = x)$, t is z ,
6. φ is $x = z + \bar{2}$, t is z ,
7. φ is $x = z$, t is $z + \bar{2}$,
8. φ is $\exists x(x = z)$, t is $z + \bar{2}$,
9. φ is $\exists y \neg(y = z) \wedge \exists x(x = z)$, t is $z + \bar{2}$.

Do not pay attention to the fact whether t is free for x in φ ; just carry the substitution out according to the definition 2.3.10. [4 points]