



Universe: All two-dimensional figures to left.

Model:

- C= circle
- T= triangle
- S= square
- B= black
- W = white
- K = contains
- a = Aloysius
- b = Boethius
- c = Corinne

Notes:

- a. K is a transitive relation.
- b. No figure contains itself.
- c. The big circle is a figure.

Translate into predicate logic.

Do not evaluate.

1. There is no more than one triangle.
2. There are at least two squares.
3. There is only one circle.
4. At most one thing contains Aloysius.
5. Nothing is both Boethius and a circle.
6. Nothing is both Boethius and Aloysius.
7. There are at most two circles.
8. If there is a circle that is in a triangle, then it is Corinne.
9. There is something that contains everything except itself.

Evaluate as true or false in the model.

10. $\forall x((Tx \vee Wx) \rightarrow x=b)$ _____
11. $\exists x(Cx \ \& \ \forall y(\sim Ty \rightarrow \sim y=b))$ _____
12. $\sim \exists x(Sx \ \& \ Bx) \vee \forall x(Tx \rightarrow \exists yKxy)$ _____
13. $\forall z \exists x(Cx \ \& \ Kzx)$ _____
14. $\forall x(Sx \rightarrow (\exists y(By \ \& \ Kxy) \vee Kxa))$ _____
15. $\forall x(Cx \rightarrow \exists y(Kxy \ \& \ \forall z(Kxz \rightarrow z=y)))$ _____
16. $\forall x \sim \exists y \exists z((Cy \ \& \ Sz) \ \& \ (Kxy \ \& \ Kxz))$ _____
17. $\forall x(Tx \rightarrow \exists y(Kxy \ \& \ Wy))$ _____
18. $\forall x((Bx \ \& \ Cx) \leftrightarrow \sim \exists y(Sy \ \& \ Kyx))$ _____
19. $\sim \exists x \forall y(Sx \ \& \ \sim Kxy)$ _____