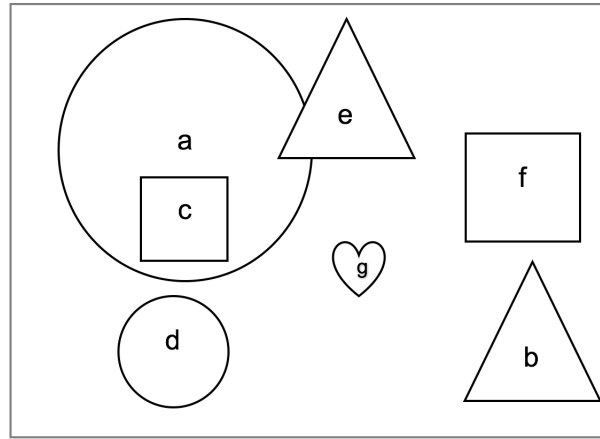**UD** : All shapes in the box　　　**Cx** : x is a circle　　　　**Lxy** : x is larger than y

Objects : a,b,c,d,e,f,g　　　　　**Hx** : x is a heart

　　　　　　　　　　　　　　　　　　　　　　　　　　　　Rxy : x is right of y

Tx : x is a triangle　　　　　　**Axy** : x is above y

Sx : x is a square　　　　　　　**Bxy** : x is below y　　　　**Wxy** : x is within y

Translate 1 - 5 into predicate logic. In 6-10 determine if the given formula is true according to the picture.

1. Carson(c) is inside Adam(a) which is above David(d).

2. No squares is larger than a circle, if it is within a a heart.

3. All squares are circles.

4. Nothing is above Frank and a circle at the same time.

5. Nothing is within everything.

6. $\forall x \exists y (Lxy \lor Rxy)$

7. $\exists x \forall y (Lxy \lor Rxy)$

8. $\forall x \forall y (Wxx \rightarrow Lyy)$

9. $\forall x \forall y (Wxy \leftrightarrow (Sx \land Cy)$

10. $\forall z (\neg \exists x Axz \lor (Tz \lor Hz))$