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Homework 2: Logic Puzzles

1. Baby(x): x is a baby
2. Rational(x): x is rational
3. Loathed(x): x is loathed
4. ManageAnAlligator(x): x can manage an alligator

Conclusion

If Alex is a baby then he cannot manage an alligator.

Proof

1. Baby(x) $\Rightarrow \neg$ Rational(x)
   If it is a baby then it is not rational.
2. ManageAnAlligator(x) $\Rightarrow \neg$ Loathed(x)
   If it can manage an alligator then it is not loathed.
3. $\neg$ Rational(x) $\Rightarrow$ Loathed(x)
   If it is not rational then it is loathed.
4. Loathed(x) $\Rightarrow \neg$ ManageAnAlligator(x)
   If it is loathed then it cannot manage an alligator.
5. Baby(x) $\Rightarrow \neg$ Rational(x) $\Rightarrow$ Loathed(x) $\Rightarrow \neg$ ManageAnAlligator(x)
   If it is a baby then it is not rational, and so it is loathed and cannot manage an alligator.
6. Baby(x) $\Rightarrow \neg$ ManageAnAlligator(x)
   If it is a baby then it cannot manage an alligator.

□ So, by contrapositive, we can conclude that if it is not a baby then it can manage an alligator and Anyone who can manage an alligator is not a baby.

$\therefore$ If Alex is a baby then he cannot manage an alligator. □