

Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Student Number: \_\_\_\_\_

Don Vito Corleone and his wife Carmella have four children: Santino, Federico, Michael and Constanzia. Santino is married to Sandra and they have four children: Santino Jr, Francesca, Kathryn and Frank. Michael is married to Kay and they have two children: Anthony and Mary. Constanzia is married to Carlo and they have two children: Victor and Michael Francis. Federico is not married and has no children.

$$\text{CORLEONES} = \left\{ \text{Don Vito, Carmella, Santino, Federico, Michael, Constanzia, Sandra, Santino Jr, Francesca, Kathryn, Frank, Kay, Anthony, Mary, Carlo, Victor, Michael Francis} \right\}.$$

Consider the following relations over the set CORLEONES:

$$\text{FATHER} = \{ (x, y) : x \text{ is the father of } y \}$$

$$\text{HUSBAND} = \{ (x, y) : x \text{ is the husband of } y \}$$

$$\text{MOTHER} = \{ (x, y) : x \text{ is the mother of } y \}$$

$$\text{WIFE} = \{ (x, y) : x \text{ is the wife of } y \}$$

$$\text{PARENT} = \{ (x, y) : x \text{ is the parent of } y \}$$

$$\text{SPOUSE} = \{ (x, y) : x \text{ is the spouse of } y \}$$

$$\text{SIBLING} = \{ (x, y) : x \text{ is the sibling of } y \}$$

$$\text{COUSIN} = \{ (x, y) : x \text{ is the cousin of } y \}$$

1. Define the relation FATHER in terms of the relations MOTHER and HUSBAND, and explain using this definition why  $(\text{Michael}, \text{Mary}) \in \text{FATHER}$ .

ANSWER:

2. Define the relation WIFE in terms of the relation HUSBAND.

ANSWER:

3. Define the relation SPOUSE in terms of the relations HUSBAND and WIFE.

ANSWER:

4. Define the relation COUSIN in terms of the relations PARENT and SIBLING, and explain using this definition why  $(\text{Frank}, \text{Victor}) \in \text{COUSIN}$ .

ANSWER: