Q. 1.

$$\sigma_{age<18}(Person)$$

Q. 2.

$$\Pi_{pizzeria, pizza, price}(\sigma_{name='Amy' \text{ AND } age<18}(Serves \bowtie Eats))$$

Q. 3.

$$\Pi_{pizzeria, name, age}(\sigma_{age<18}(Frequents \bowtie Person))$$

Q. 4.

$$\Pi_{pizzeria}(Frequents \bowtie_{person.name=frequents.name \text{ AND } person.age<18} Person)$$

$$\cap$$

$$\Pi_{pizzeria}(Frequents \bowtie_{person.name=frequents.name \text{ AND } person.age>30} Person)$$

Q. 5.

$$A = \Pi_{pizzeria, person.name, person.age}(\sigma_{age<18}(Person \bowtie_{person.name=frequents.name}$$

Frequents))

$B = \Pi_{pizzeria, person.name, person.age}$

$(\sigma_{age>30}$ (Person $\bowtie_{person.name = frequents.name}$

Frequents))

$\Pi_{A.pizzeria, A.name \to person1, A.age \to age1,}$

$B.name, B.age \to age2$

$(A \bowtie_{A.pizzeria = B.pizzeria} B)$

Q. 6.

$\gamma^{name}_{count(pizza) \to countpizza}(\sigma_{count(pizza)>=2}$

(Eats))

Q. 7.

$\gamma^{Pizza}_{avg(price) \to avgprice}$ (Serves)