(a)

$$\Pi_{vin,color}(Vehicles \bowtie \sigma_{price \geq 15000}(Vans)) \cup$$
$$\Pi_{vin,color}(Vehicles \bowtie \sigma_{price \geq 15000}(Cars)) \cup$$
$$\Pi_{vin,color}(Vehicles \bowtie \sigma_{price \geq 15000}(SUVs))$$

(b)

$$\Pi_{manufacturer,model,price}(\sigma_{price<12000}(Vehicles \bowtie Vans))$$

(c)

$$\Pi_{model,price}(\Sigma_{manufacturer='homda'}(Vans)) \cup$$
$$\Pi_{model,price}(\Sigma_{manufacturer='homda'}(Cars)) \cup$$
$$\Pi_{model,price}(\Sigma_{manufacturer='homda'}(SUVs))$$

(d)

$$\Pi_{manufacturer}(Cars) - \Pi_{manufacturer}(Vans)$$