Formalize each of the following statements as a binary expression.

(a) Everybody loves somebody sometime.
\[ \forall p: \text{people} \cdot \exists q: \text{people} \cdot \exists t: \text{time} \cdot (p \text{ loves } q \text{ at time } t) \]

(b) Every 10 minutes someone in New York City gets mugged.
\[ \forall t: (10 \text{ minute intervals}) \cdot \exists p: \text{(people of New York City)} \cdot (p \text{ gets mugged at time } t) \]
More likely the speaker is trying to say
(a long time in minutes)
/ (the number of people in New York City who get mugged during that time)
= 10 approximately

(c) Every 10 minutes someone keeps trying to reach you.
\[ \exists p: \text{people} \cdot \forall t: (10 \text{ minute intervals}) \cdot (p \text{ tries to reach you at time } t) \]

(d) Whenever the altitude is below 1000 feet, the landing gear must be down.
\[ \forall a: \text{real} \cdot a < 1000 \Rightarrow (\text{gear down}) \]

(e) I'll see you on Tuesday, if not before.
\[ \text{Let } s \text{ be a predicate of time, so that } s t \text{ means I'll see you at time } t \text{. If the given statement means I'll see you on Tuesday regardless of whether I see you before, then} \]
\[ s \text{ Tuesday} \]
But if it means I'll see you sometime between now and then,
\[ \exists t: \text{now } < t \leq \text{Tuesday} \land s t \]

(f) No news is good news.
\[ \text{Maybe this means the same as “There's no such thing as good news.”. If so, we might formalize it as} \]
\[ \neg \exists n: \text{news} \cdot \text{good } n \]
where \text{news} is all the news and \text{good} is a predicate over \text{news}. But I think it was intended to mean the same as “The fact that there isn't any news is a piece of good news.”. I'll let \text{news}: *\text{char} be a bunch of texts. Then we might formalize it as
\[ “\text{news}=null” \land \text{good “news=null”} \]
Or it might mean “If there isn't any news then that will be a piece of good news.”.
\[ \text{news}=null \Rightarrow “\text{news}=null” \land \text{good “news=null”} \]
If “\text{news}=null” \land \text{news} then \text{news}=null is false, so “\text{news}=null” is false news, but there's no logical inconsistency.

(g) I don't agree with anything you say.
\[ \text{Introduce prefix operators } I\text{agreewith and } Y\text{ousay.} \]
\[ \forall x: \neg (I\text{agreewith } x) \iff (Y\text{ousay } x) \]

(h) I don't agree with everything you say.
\[ \text{Introduce prefix operators } I\text{agreewith and } Y\text{ousay. It seems to me there are two possible interpretations for the sentence. One is the same as part (g).} \]
\[ \forall x: \neg (I\text{agreewith } x) \iff (Y\text{ousay } x) \]
The other is
\[ \neg \forall x: (I\text{agreewith } x) \iff (Y\text{ousay } x) \]
They are not equivalent. To decide between them requires more context.