Question 1-2

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Questions 1-2

2/2 points (graded)

Consider the following Data Definition:

```
;; ListOfNatural is one of:
;; - empty
;; - (cons Natural ListOfNatural)
```

Is `empty` a ListOfNatural? In other words, does `empty` match the type ListOfNatural?

- (•) yes
- ( ) no

✔

Explanation
Yes, `empty` is the first case, so it matches the type ListOfNatural.

Is `(cons 1 (cons 1.5 empty))` a ListOfNatural?

- ( ) yes
- (•) no

✔

Explanation
First we look at the case `(cons Natural ListOfNatural)` and ask is 1 Natural? The answer is yes. Then we ask if `(cons 1.5 empty)` is ListOfNatural. This requires `1.5` to be Natural, which it is not, so `(cons 1 (cons 1.5 empty)` is not a ListOfNatural.

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Question 3

1/1 point (graded)

Consider the following partial data definition:

```
;; Mystery is one of:
;; - (cons 1 empty)
;; - (cons Natural Mystery)
```

Which of the following match the type mystery?

- [ ] `(cons 2 empty)`
- [x] `(cons 1 empty)`
- [x] `(cons 5 (cons 4 (cons 1 empty)))`
- [ ] empty

✔

Explanation
For the first option, `2` is of type `Natural`, but empty is not a `Mystery`, so it does not match.
The second option is exactly `(cons 1 empty)`.
In the third option, `5` is of type `Natural`, so we need to check if `(cons 4 (cons 1 empty))` is a mystery. Next, we see that `4` is `Natural`, so we need `(cons 1 empty)` to be a `Mystery`, which it is.
In the fourth case, `empty` is neither `(cons 1 empty)` nor `(cons Natural Mystery)`.

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