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How do I use ?NumericQ to affect order of evaluation?

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When using numerical functions such as `NIntegrate` or `NMaximize`, order of evaluation is important. Consider the following function called `f`:

```
f[a_] := NIntegrate[ (2 - a) Sin[a x], {x, 0, Pi}]
```

The function `f` looks like a well-defined function, because it evaluates for numeric values such as `f[0.5]`. The problem appears when the function `f` is given a symbol instead of a number:

```
f[a]


NIntegrate::inumr :  The integrand (2 - a) Sin[a x] has evaluated to
non-numerical values for all sampling points in the region with
boundaries {{0, Pi}}
```

Because `a` is not defined, the Wolfram Language cannot numerically integrate the expression `(2 - a) Sin[a x]` with respect to `x`. This is an issue for any function that might evaluate `f[a]` before providing a value for `a`. For example, the Wolfram Language cannot numerically maximize the function `f`:

```
NMaximize[f[a], a]


NIntegrate::inumr :  The integrand (2 - a) Sin[a x] has evaluated to
non-numerical values for all sampling points in the region with
boundaries {{0, Pi}}
```

This code gives the same error message as when just `f[a]` is evaluated. In this example, `f[a]` is evaluated before the full `NMaximize` statement.

To change the order of evaluation, define the function `f` to only evaluate if it receives a numeric value by using `NumericQ` and pattern testing. Append the pattern `?NumericQ` to the argument of the function `f`:

```
Clear[f]

f[a_?NumericQ] := NIntegrate[ (2 - a) Sin[a x], {x, 0, Pi}]
```

Now evaluating `f[a]` returns the function unevaluated instead of producing an error message. The Wolfram Language can numerically maximize the new definition of `f` because the pattern `?NumericQ` changes the order of evaluation:

```
NMaximize[f[a], a]

 {3.05716, {a -> 0.581569}}}
```

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