

## Setting up null and alternative hypotheses

For each of the following problem descriptions write down the null and alternative hypotheses using both statistical notation and plain english.



In old England tea drinking ruled. Its very important that if a person wishes to have milk with their tea then the milk should be poured into the cup first! A woman claims when presented with a cup of tea she can tell if the milk or the tea was poured first. Suppose you present her with 30 cups of tea, and you know for each cup whether it was the milk or tea poured first.

$p =$

Statistical notation:  $H_o :$

$H_a :$

Plain English:

$H_o :$

$H_a :$



Suppose that a survey of dentists finds that 60% of the dentists surveyed recommend a Sonicare Advance 4100 power toothbrush to BRAUN Oral B D17535-DTCL 3D Excel Cordless Toothbrush. Does this provide strong evidence that more than half of all dentists prefer the Sonicare brush?

$p =$

Statistical notation:  $H_o :$

$H_a :$

Plain English:

$H_o :$

$H_a :$



Suppose that the IRA wants to decide if the proportion of US taxpayers returns that have numerical errors is significantly different from 30%. Suppose they take a simple random sample of returns and find that 15,313 contain numerical errors.

$p =$

Statistical notation:  $H_o :$

$H_a :$

Plain English:

$H_o :$

$H_a :$