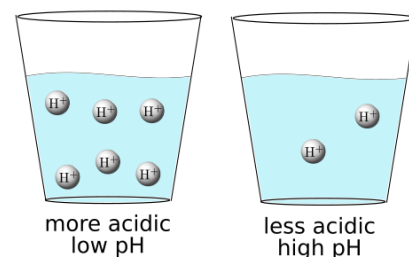


## pH Indicators and Titration

- **Acids** are chemicals that like to drop hydrogen ions ( $H^+$ ) when dissolved in water.
- **Bases** are chemicals that grab extra hydrogen ions ( $H^+$ ) out of solution.
- The **pH** of a **solution** measures how many  $H^+$  ions
  - Low pH (below 7) means acidic (lots of  $H^+$  ions).
  - High pH (above 7) means basic (few  $H^+$  ions)
- A **pH indicator** turns different colors depending on the pH of the solution.



### Part 1: pH Indicator

1. Put 2 teaspoons of the purple cabbage juice into each of 6 wells in the egg carton.

2. Add 1 teaspoon of each of the substances in the table below, one per well. Fill in the table with the color observed, and your best estimate of the pH.



Substance	Color	pH estimate
water		
vinegar		
Baking soda ( $\frac{1}{4}$ teaspoon)		
Lemon juice		
Sprite or 7-up		
Windex		

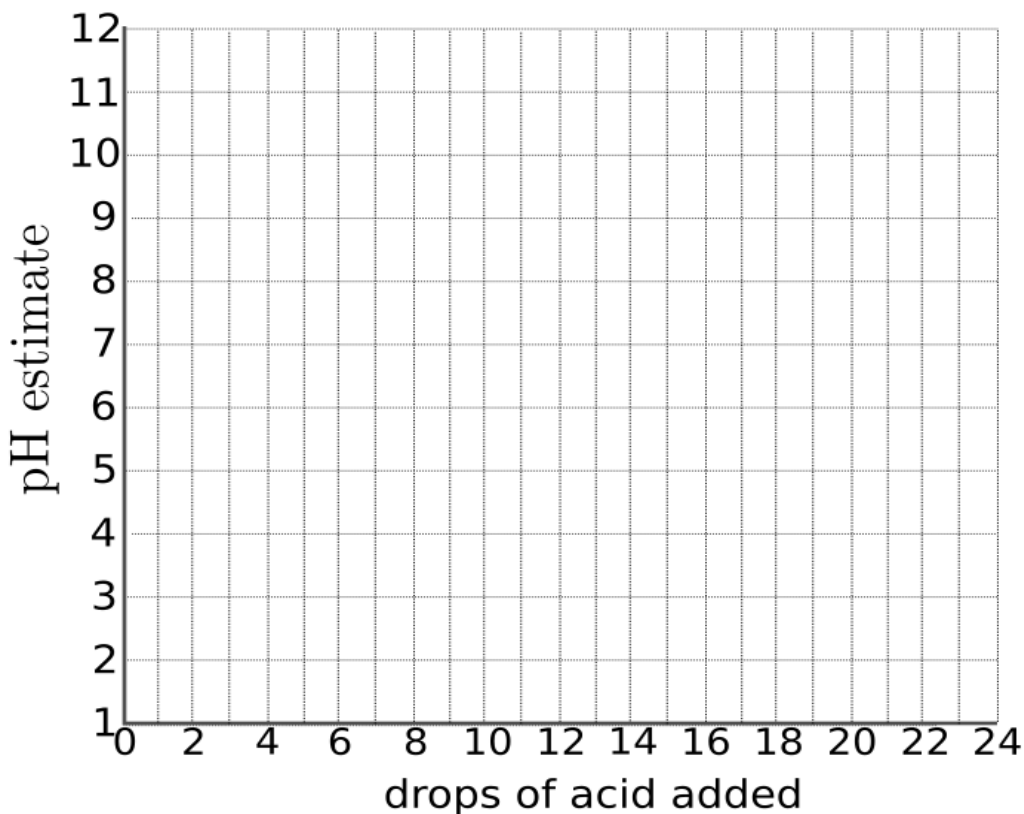
List the substances from most acidic to most basic:

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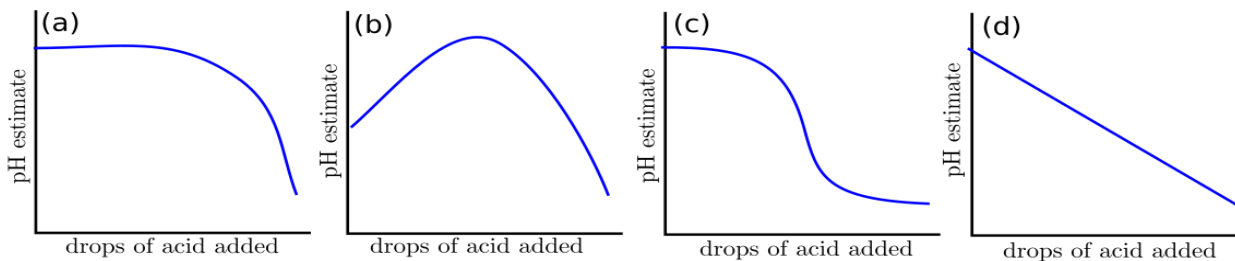
Two of the substances have very similar acidities. Which two?



3. Use the data in your table to plot points on the graph below. Connect them with straight lines.



Which of the following looks most like your graph?



Approximately how many drops of vinegar did you need to get a neutral solution?

4. If you have extra time: make another well with 3 teaspoons of cabbage juice + 1 teaspoon of Windex. Repeat the titration, one drop at a time, with lemon juice. Plot on the same graph above.

Approximately how many drops of lemon juice did you need to get a neutral solution?

Which of your substances is more acidic (circle one):      vinegar                      lemon juice