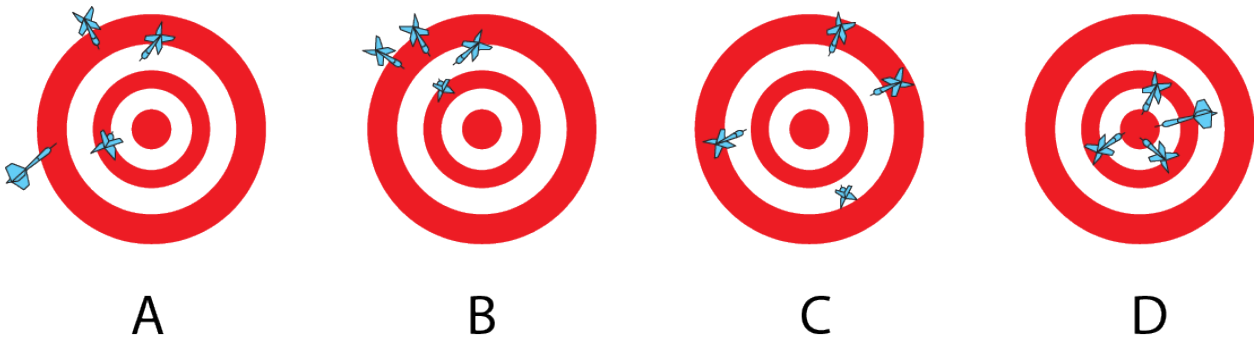
Worksheet 1

1. How many significant figures does each of the following have?
   - 1.427×10^{2}
   - 9.250×10^{5}
   - 106
   - $4.3179\times10^{12} * 3.6\times10^{-19}$
   - $15 + 18.65$
   - $1.632\times10^{5} - 4.107\times10^{3} + 9.84\times10^{5}$
   - 34.60 / 2.46287
2. State the type of error and which statistical measure it would have the greatest effect on (Mean or Standard Deviation) for each of the following:
   - A pH meter that was incorrectly standardized
   - The air conditioner turns on and off during your experiment
   - The TA transposes two of the digits in the reported stock concentration
   - The manufacturer fails to calibrate a buret
   - Your lab partner reads between the lines on a graduated cylinder
3. Label each of the following as either precise or not precise and accurate or not accurate.



4. Using the table below, determine which volumetric flask you would use to make 32 mL of solution when:
   - Cost is the most important factor
   - Accuracy and precision are the most important factors
   - Your research advisor says you have to minimize cost but your results must be perfect

Capacity (mL)	Tolerance (±mL)
25	0.03
50	0.08
100	0.08
1000	0.06

5. Using the table below, rank the 10mL pipets in terms of accuracy and in terms of precision.

	Pipet A	Pipet B	Pipet C
Trial 1	10.41	10.30	9.67
Trial 2	10.76	9.33	9.87
Trial 3	10.91	10.84	10.67
Trial 4	10.30	10.52	9.18
Trial 5	10.97	10.30	9.56

6. True or False

   - Graduated cylinders are more accurate and precise than volumetric glassware.
   - Dilution in one step is better than two.
   - Larger glassware has less uncertainty.
   - Mohr pipets are more precise than volumetric pipets.
   - Glassware is designed to hold a specific volume no matter the temperature.

7. How many mL of 0.15 M HCl is needed to make 100 mL of 0.025 M HCl?

8. How would you perform the dilution above?