

AP Statistics

Unit 1 Review

Exam on Sep 8

1. If $X = \{0, 1, 2, 3\}$, define a probability mass function on X by the formula $f(x) = \frac{a}{x^2 + 1}$.
 - (a) Find the value of a .
 - (b) Find $Prob(X > 1)$.
2. Angela scored a 73% on her History exam where the class mean was 68% and the standard deviation was 10%. In Math, her score was 66% while the class mean was 60% and standard deviation was 7%. Assuming the distribution of scores is approximately normal, in which subject did Angela do better, relative to her classes?
3. Consider the back-to-back stem and leaf plot which keeps track of the 100 meter freestyle times.

Girls		Boys
	32	1
4	33	0 2 2 7
7 6 3	34	1 3 4 4 8
8 7 4 3 0	35	0 2 4 7 9 9
8 8 3 3	36	7 8 8
7 6 6 6	37	0
6	38	
0	39	
	40	
1	41	

- (a) Describe *the shape* of distribution of swim times for each of the categories.
 - (b) What are the medians?
 - (c) What is the range?
 - (d) Identify any outliers.
4. Let $X = \{5, 6, 8, a, 3, b\}$ be a variable with mean of 6 and variance of 3.
 - (a) Find the value of a and b (assuming $a \leq b$).
 - (b) Find the median of the set.
 - (c) Find the interquartile range.

5. For each of the type of chart, determine whether or not it is for a *categorical variable*, *quantitative discrete variable* or a *quantitative continuous variable*:

- (a) Pie charts
- (b) Dot plots
- (c) Histograms
- (d) Bar graphs
- (e) Segmented bar graphs
- (f) Cumulative frequency graphs
- (g) Stem and leaf plots
- (h) Frequency tables

6. (Calculus required) A random variable $X = (0, 2)$ has a probability density function

$$f(x) = \begin{cases} ax^2(2-x) & \text{if } 0 < x < 2 \\ 0 & \text{else} \end{cases}$$

- (a) Show that $a = 0.75$.
- (b) Find the median of X .
- (c) Find $Prob(0.6 < X < 1.2)$