

## Problem 1

Fill in the blank with the *capital* letter associated with the word from the following list that *best* illustrates the given scenario.

- |                   |                         |                      |                       |
|-------------------|-------------------------|----------------------|-----------------------|
| A. Boxplot        | B. Simple Random Sample | C. Stratified Sample | D. Convenience Sample |
| E. Cluster Sample | F. Probability Sample   | G. Time series       | H. Cross-sectional    |
| I. Nominal        | J. Ordinal              | K. Experimental      | L. Observational      |

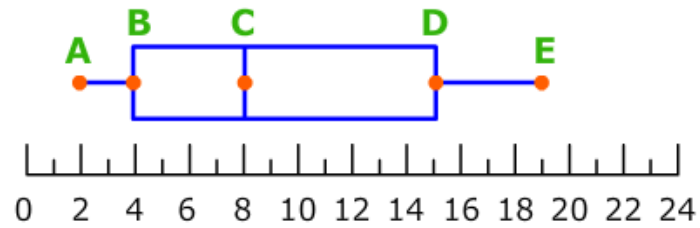
(a) Likert scale questions typically have answers like very dissatisfied, dissatisfied, neutral, satisfied, and very satisfied. This is a \_\_\_\_\_, qualitative variable.

(b) Daily temperatures in Clemson from 1950-2015 is a \_\_\_\_\_, data set.

(c) Noah divided the animal kingdom into species and gender, then randomly picked 1 from each combination. What sampling technique did he use? \_\_\_\_\_

(d) A scientist tries his weight loss drug on a group of monkeys with identical diets. 60 monkeys are randomly assigned to either get the drug or not get the drug (30 in each group). The weight gained/lost was recorded for each monkey. This is an \_\_\_\_\_study.

## Problem 2



Use the boxplot above to answer the following questions.

(a) What does the labeled point C represent on the boxplot plot?

*A* : Mean

*B* : Median

*C* : Mode

*D* : Range

(b) What do the labeled points B and D represent on the boxplot?

*A* : Mean and Mode

*B* : Median and Mode

*C* : Least and Greatest value

*D* : Lower and Upper quartile

(c) What is the maximum value of the data set?

*A* : 8

*B* : 11

*C* : 15

*D* : 19

(d) If we replace the maximum value by 38, which of the following statistics WILL NOT change?

*A* : Range

*B* : Mean

*C* : Variance

*D* : IQR

### Problem 3

Use the data pertaining to marital status and gender to calculate the following probabilities.

	Married	Single	Divorced/Widowed	Total
Men	55	100	45	200
Women	90	35	25	150
Total	145	135	70	350

- (a) What percent of the individuals were male?
  
  
  
  
  
  
  
  
  
  
- (b) What percent of the individuals were male and married?
  
  
  
  
  
  
  
  
  
  
- (c) What percent of the men were single?
  
  
  
  
  
  
  
  
  
  
- (d) What percent of the married individuals were male?

## Problem 4

Event  $A$ : Rolling at least one six in 4 throws of a die

Event  $B$ : Rolling at least one double six in 24 throws of a pair of dice

(a) Let  $X$  be the number of six in 4 throws of a die and  $Y$  be the number of double six in 24 throws of a pair of dice, State the distribution and parameters for  $X$  and  $Y$ , respectively.

(b) Compute  $\mathbb{E}[X]$  and  $\mathbb{E}[Y]$ .

(c) Compute the probability of event  $A$  and event  $B$ . Which event is more likely to occur?

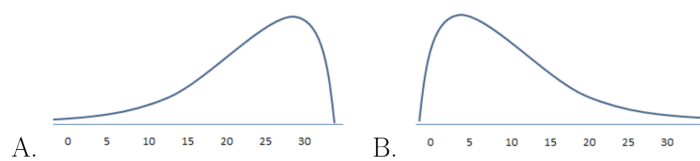
## Problem 5

Denver Downs has a large pumpkin patch, where the weight of the pumpkins follows a normal distribution with an average of 14 pounds, and a standard deviation of 4 pounds. Each pumpkin's weight is independent of all other pumpkins.

- (a) What is the probability that a randomly selected pumpkin weighs over 16 pounds?
  
  
  
  
  
  
  
  
  
  
- (b) What is the probability that a randomly selected pumpkin weighs over 16 pounds given that the selected pumpkin weighs over 14 pounds?
  
  
  
  
  
  
  
  
  
  
- (c) Using the empirical rule to find the cutoff for the top 2.5% of pumpkin weights at Denver Downs.

## Problem 6

Use the graphs below to answer the following questions.



(a) Of graphs A and B, which graph(s) are skewed right? *Circle all that apply.*

A      B      None

(b) Of graphs A and B, which has the larger 25th percentile? *Circle one answer.*

A      B      Same

## Problem 7

Given  $\mathbb{P}(A) = 0.6$ ,  $\mathbb{P}(B) = 0.4$

- (a) What is the range of possible value of  $\mathbb{P}(A \cap B)$ ?
  
  
  
  
  
  
  
  
  
  
- (b) What is the largest possible value of  $\mathbb{P}((A \cup B)^c)$ ?
  
  
  
  
  
  
  
  
  
  
- (c) Suppose  $\mathbb{P}(A|B) = 0.8$ , what is the value of  $\mathbb{P}(B|A)$ ?



<b>z</b>	<b>0</b>	<b>0.01</b>	<b>0.02</b>	<b>0.03</b>	<b>0.04</b>	<b>0.05</b>	<b>0.06</b>	<b>0.07</b>	<b>0.08</b>	<b>0.09</b>
<b>-0</b>	.50000	.49601	.49202	.48803	.48405	.48006	.47608	.47210	.46812	.46414
<b>-0.1</b>	.46017	.45620	.45224	.44828	.44433	.44034	.43640	.43251	.42858	.42465
<b>-0.2</b>	.42074	.41683	.41294	.40905	.40517	.40129	.39743	.39358	.38974	.38591
<b>-0.3</b>	.38209	.37828	.37448	.37070	.36693	.36317	.35942	.35569	.35197	.34827
<b>-0.4</b>	.34458	.34090	.33724	.33360	.32997	.32636	.32276	.31918	.31561	.31207
<b>-0.5</b>	.30854	.30503	.30153	.29806	.29460	.29116	.28774	.28434	.28096	.27760
<b>-0.6</b>	.27425	.27093	.26763	.26435	.26109	.25785	.25463	.25143	.24825	.24510
<b>-0.7</b>	.24196	.23885	.23576	.23270	.22965	.22663	.22363	.22065	.21770	.21476
<b>-0.8</b>	.21186	.20897	.20611	.20327	.20045	.19766	.19489	.19215	.18943	.18673
<b>-0.9</b>	.18406	.18141	.17879	.17619	.17361	.17106	.16853	.16602	.16354	.16109
<b>-1</b>	.15866	.15625	.15386	.15151	.14917	.14686	.14457	.14231	.14007	.13786
<b>-1.1</b>	.13567	.13350	.13136	.12924	.12714	.12507	.12302	.12100	.11900	.11702
<b>-1.2</b>	.11507	.11314	.11123	.10935	.10749	.10565	.10383	.10204	.10027	.09853
<b>-1.3</b>	.09680	.09510	.09342	.09176	.09012	.08851	.08692	.08534	.08379	.08226
<b>-1.4</b>	.08076	.07927	.07780	.07636	.07493	.07353	.07215	.07078	.06944	.06811
<b>-1.5</b>	.06681	.06552	.06426	.06301	.06178	.06057	.05938	.05821	.05705	.05592
<b>-1.6</b>	.05480	.05370	.05262	.05155	.05050	.04947	.04846	.04746	.04648	.04551
<b>-1.7</b>	.04457	.04363	.04272	.04182	.04093	.04006	.03920	.03836	.03754	.03673
<b>-1.8</b>	.03593	.03515	.03438	.03362	.03288	.03216	.03144	.03074	.03005	.02938
<b>-1.9</b>	.02872	.02807	.02743	.02680	.02619	.02559	.02500	.02442	.02385	.02330
<b>-2</b>	.02275	.02222	.02169	.02118	.02068	.02018	.01970	.01923	.01876	.01831
<b>-2.1</b>	.01786	.01743	.01700	.01659	.01618	.01578	.01539	.01500	.01463	.01426
<b>-2.2</b>	.01390	.01355	.01321	.01287	.01255	.01222	.01191	.01160	.01130	.01101
<b>-2.3</b>	.01072	.01044	.01017	.00990	.00964	.00939	.00914	.00889	.00866	.00842
<b>-2.4</b>	.00820	.00798	.00776	.00755	.00734	.00714	.00695	.00676	.00657	.00639
<b>-2.5</b>	.00621	.00604	.00587	.00570	.00554	.00539	.00523	.00508	.00494	.00480
<b>-2.6</b>	.00466	.00453	.00440	.00427	.00415	.00402	.00391	.00379	.00368	.00357
<b>-2.7</b>	.00347	.00336	.00326	.00317	.00307	.00298	.00289	.00280	.00272	.00264
<b>-2.8</b>	.00256	.00248	.00240	.00233	.00226	.00219	.00212	.00205	.00199	.00193
<b>-2.9</b>	.00187	.00181	.00175	.00169	.00164	.00159	.00154	.00149	.00144	.00139
<b>-3</b>	.00135	.00131	.00126	.00122	.00118	.00114	.00111	.00107	.00104	.00100
<b>-3.1</b>	.00097	.00094	.00090	.00087	.00084	.00082	.00079	.00076	.00074	.00071
<b>-3.2</b>	.00069	.00066	.00064	.00062	.00060	.00058	.00056	.00054	.00052	.00050
<b>-3.3</b>	.00048	.00047	.00045	.00043	.00042	.00040	.00039	.00038	.00036	.00035
<b>-3.4</b>	.00034	.00032	.00031	.00030	.00029	.00028	.00027	.00026	.00025	.00024
<b>-3.5</b>	.00023	.00022	.00022	.00021	.00020	.00019	.00019	.00018	.00017	.00017
<b>-3.6</b>	.00016	.00015	.00015	.00014	.00014	.00013	.00013	.00012	.00012	.00011
<b>-3.7</b>	.00011	.00010	.00010	.00010	.00009	.00009	.00008	.00008	.00008	.00008
<b>-3.8</b>	.00007	.00007	.00007	.00006	.00006	.00006	.00006	.00005	.00005	.00005
<b>-3.9</b>	.00005	.00005	.00004	.00004	.00004	.00004	.00004	.00004	.00003	.00003
<b>-4</b>	.00003	.00003	.00003	.00003	.00003	.00003	.00002	.00002	.00002	.00002

1.1 – Negative Z Table

<b>z</b>	<b>0</b>	<b>0.01</b>	<b>0.02</b>	<b>0.03</b>	<b>0.04</b>	<b>0.05</b>	<b>0.06</b>	<b>0.07</b>	<b>0.08</b>	<b>0.09</b>
<b>+0</b>	.50000	.50399	.50798	.51197	.51595	.51994	.52392	.52790	.53188	.53586
<b>+0.1</b>	.53983	.54380	.54776	.55172	.55567	.55966	.56360	.56749	.57142	.57535
<b>+0.2</b>	.57926	.58317	.58706	.59095	.59483	.59871	.60257	.60642	.61026	.61409
<b>+0.3</b>	.61791	.62172	.62552	.62930	.63307	.63683	.64058	.64431	.64803	.65173
<b>+0.4</b>	.65542	.65910	.66276	.66640	.67003	.67364	.67724	.68082	.68439	.68793
<b>+0.5</b>	.69146	.69497	.69847	.70194	.70540	.70884	.71226	.71566	.71904	.72240
<b>+0.6</b>	.72575	.72907	.73237	.73565	.73891	.74215	.74537	.74857	.75175	.75490
<b>+0.7</b>	.75804	.76115	.76424	.76730	.77035	.77337	.77637	.77935	.78230	.78524
<b>+0.8</b>	.78814	.79103	.79389	.79673	.79955	.80234	.80511	.80785	.81057	.81327
<b>+0.9</b>	.81594	.81859	.82121	.82381	.82639	.82894	.83147	.83398	.83646	.83891
<b>+1</b>	.84134	.84375	.84614	.84849	.85083	.85314	.85543	.85769	.85993	.86214
<b>+1.1</b>	.86433	.86650	.86864	.87076	.87286	.87493	.87698	.87900	.88100	.88298
<b>+1.2</b>	.88493	.88686	.88877	.89065	.89251	.89435	.89617	.89796	.89973	.90147
<b>+1.3</b>	.90320	.90490	.90658	.90824	.90988	.91149	.91308	.91466	.91621	.91774
<b>+1.4</b>	.91924	.92073	.92220	.92364	.92507	.92647	.92785	.92922	.93056	.93189
<b>+1.5</b>	.93319	.93448	.93574	.93699	.93822	.93943	.94062	.94179	.94295	.94408
<b>+1.6</b>	.94520	.94630	.94738	.94845	.94950	.95053	.95154	.95254	.95352	.95449
<b>+1.7</b>	.95543	.95637	.95728	.95818	.95907	.95994	.96080	.96164	.96246	.96327
<b>+1.8</b>	.96407	.96485	.96562	.96638	.96712	.96784	.96856	.96926	.96995	.97062
<b>+1.9</b>	.97128	.97193	.97257	.97320	.97381	.97441	.97500	.97558	.97615	.97670
<b>+2</b>	.97725	.97778	.97831	.97882	.97932	.97982	.98030	.98077	.98124	.98169
<b>+2.1</b>	.98214	.98257	.98300	.98341	.98382	.98422	.98461	.98500	.98537	.98574
<b>+2.2</b>	.98610	.98645	.98679	.98713	.98745	.98778	.98809	.98840	.98870	.98899
<b>+2.3</b>	.98928	.98956	.98983	.99010	.99036	.99061	.99086	.99111	.99134	.99158
<b>+2.4</b>	.99180	.99202	.99224	.99245	.99266	.99286	.99305	.99324	.99343	.99361
<b>+2.5</b>	.99379	.99396	.99413	.99430	.99446	.99461	.99477	.99492	.99506	.99520
<b>+2.6</b>	.99534	.99547	.99560	.99573	.99585	.99598	.99609	.99621	.99632	.99643
<b>+2.7</b>	.99653	.99664	.99674	.99683	.99693	.99702	.99711	.99720	.99728	.99736
<b>+2.8</b>	.99744	.99752	.99760	.99767	.99774	.99781	.99788	.99795	.99801	.99807
<b>+2.9</b>	.99813	.99819	.99825	.99831	.99836	.99841	.99846	.99851	.99856	.99861
<b>+3</b>	.99865	.99869	.99874	.99878	.99882	.99886	.99889	.99893	.99896	.99900
<b>+3.1</b>	.99903	.99906	.99910	.99913	.99916	.99918	.99921	.99924	.99926	.99929
<b>+3.2</b>	.99931	.99934	.99936	.99938	.99940	.99942	.99944	.99946	.99948	.99950
<b>+3.3</b>	.99952	.99953	.99955	.99957	.99958	.99960	.99961	.99962	.99964	.99965
<b>+3.4</b>	.99966	.99968	.99969	.99970	.99971	.99972	.99973	.99974	.99975	.99976
<b>+3.5</b>	.99977	.99978	.99978	.99979	.99980	.99981	.99981	.99982	.99983	.99983
<b>+3.6</b>	.99984	.99985	.99985	.99986	.99986	.99987	.99987	.99988	.99988	.99989
<b>+3.7</b>	.99989	.99990	.99990	.99990	.99991	.99991	.99992	.99992	.99992	.99992
<b>+3.8</b>	.99993	.99993	.99993	.99994	.99994	.99994	.99994	.99995	.99995	.99995
<b>+3.9</b>	.99995	.99995	.99996	.99996	.99996	.99996	.99996	.99996	.99997	.99997
<b>+4</b>	.99997	.99997	.99997	.99997	.99997	.99997	.99998	.99998	.99998	.99998

12 – Positive Z Table