Quiz 7 Review Sheet

Name: _____

Probability Distributions & Expected Value

Vocabulary—*Use your notes to find the exact answer that fits each blank.*

1. The symbol used to denote the population mean is _____μ_____.
2. The symbol used to denote the population standard deviation is _____σ_____.
3. The population _____Standard deviation_____ _____ measures how spread out all of numbers are.
4. The population _____Mean_____ is equal to the average of the given property while considering every member of the population.
5. A _____Random variable_____ _____ is a variable whose values are determined by chance
6. A variable obtained from data that must be counted whose values are determined by chance are called _____Discrete_____ random variables
7. A variable obtained from data that must be measured whose values are determined by chance are called _____Continuous_____ random variables
8. A _____Probability distribution_____ _____ consists of all possible outcomes, X, and the corresponding probabilities of the outcomes, $P(X)$
9. The _____Expected value_____ _____ of a random variable is intuitively the long-run average value of repetitions of the experiment it represents.

Discrete or Continuous Random Variables

10. The time it takes a student selected at random to register for the fall semester _____continuous_____
11. The number or bad checks drawn on Upright Bank on a day selected at random _____discrete_____
12. The amount of gasoline needed to drive your car 200 miles _____continuous_____
13. The number of traffic fatalities per year in the state of Florida _____discrete_____
14. The distance a golf ball travels after being hit with a driver _____continuous_____
15. The number of ships in Pearl Harbor on any given day _____discrete_____
16. Your weight before breakfast each morning _____continuous_____

Work Problems—*answer each question fully.*

For numbers 17-19, state if the following are valid probability distributions? If not, state a reason.

17.

X	30	31	32	33	34
P(X)	0.35	0.21	0.38	0.25	0.11

No; because it adds up to 1.3

18.

X	0	1	2	3
P(X)	0.2	0.6	0.4	-0.2

No; because -0.2 is not between 0 and 1

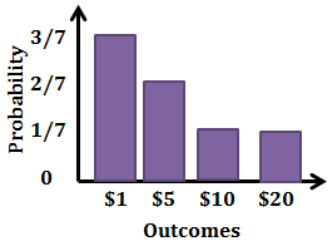
19.

X	2	2.5	3	3.5
P(X)	1/12	1/4	1/8	13/24

Yes!

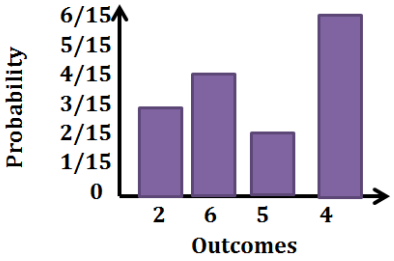
20. A box contains three \$1 bills, two \$5 bills, one \$10 bill, and one \$20 bill. Construct a probability distribution. Graph the results.

X	\$1	\$5	\$10	\$20
P(X)	3/7	2/7	1/7	1/7



21. A bag of marbles contains three red marbles that count as 2 points each. four blue marbles that count as 6 points each, two orange marbles that count as 5 points each, and six green marbles that count as 4 points each. Construct a probability distribution. Graph the results.

X	2	6	5	4
P(X)	$\frac{3}{15}$	$\frac{4}{15}$	$\frac{2}{15}$	$\frac{6}{15}$



Find the mean and the standard deviation of the following probability distributions.

22.

X	0	1	2	3	4	5
P(X)	0.06	0.42	0.22	0.12	0.15	0.03

μ = 1.97 σ = 1.28

23.

X	0	2	4	6
P(X)	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{4}$

μ = 3.5 σ = 1.94

Find the expected value of each problem.

24. One thousand tickets are sold are \$2.50 each for four prizes (one of each) of \$1000, \$100, \$50, and \$25. What is the expected value if a person purchases one ticket?

X	-2.5	997.5	97.5	47.5	22.5
P(X)	$\frac{996}{1000}$	$\frac{1}{1000}$	$\frac{1}{1000}$	$\frac{1}{1000}$	$\frac{1}{1000}$

$E(X)$ = −1.33

25. A lottery offers one \$1500 prize, one \$600 prize, and five \$75 prizes. One thousand tickets are sold at \$3 each. Find the expected value if a person buys one ticket.

X	-3	1497	597	72
P(X)	$\frac{993}{1000}$	$\frac{1}{1000}$	$\frac{1}{1000}$	$\frac{5}{1000}$

$E(X)$ = −0.53

26. Two thousand tickets are sold at \$1 each for a computer system valued at \$1500. What is the expected value if a person purchases **<u>two</u>** tickets?

X	-2	1498
P(X)	$\frac{1998}{2000}$	$\frac{2}{2000}$

$E(X)$ = −0.50