Exam Review (3) AP Statistics

Random Variables
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1. Consider the following set of random variables:

A. Total number of points scored during a football game

B. Lifespan in hours of a halogen light bulb

C. Height in feet of the ocean's tide at a given location

D. Number of fatalities in civilian aircraft crashes in a given year

E. Length in inches of an adult rattlesnake

Which of these are *continuous* random variables?

A. B and C only.

B. B, C, and E only.

C. A and D only.

2. Which of the following probability distributions of a discrete random variable X is *not* a legitimate distribution?

A.

x	1	2	3
P(x)	0.3	0.3	0.4

B.

x	-1	0	1
P(x)	0.2	0.2	0.5

C.

x	-1	0	1
P(x)	0.3	0.4	0.3

3. Suppose there is a deck of three cards, one marked with a 1, one marked with a 2, and one marked with a 5. You draw two cards at random and without replacement from the deck of three cards. The sample space $S = \{(1, 2), (1, 5), (2, 5)\}$ consists of these three equally likely outcomes. Let X be the total of the two cards drawn. Which of the following is the correct set of probabilities for X?

A.

X	1	2	5
P(X)	1/3	1/3	1/3

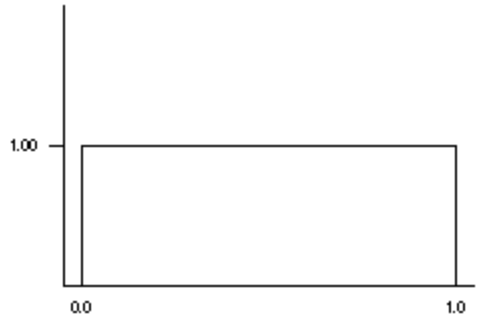
B.

X	3	6	7
P(X)	1/3	1/3	1/3

C.

X	3	6	7
P(X)	3/16	6/16	7/16

4. Let the random variable X be a random number with the uniform density curve given below.



P (0.7 < X < 1.1) has value

A. 0.30

B. 0.40

C. 0.70

5. The daily sales total (excepting Saturday) at a small restaurant has a probability distribution that is approximately normal with a mean of μ = $530 and a standard deviation of σ = $120. The probability that sales will exceed $700 on a given day is approximately:

A. 0.0778

B. 0.9222

C. 0.5778

6. In a particular game, a ball is randomly chosen from a box that contains 3 red balls, 1 green ball, and 6 blue balls. If a red ball is selected you win $2, if a green ball is selected you win $4, and if a blue ball is selected you win nothing. Let X be the amount that you win. The expected value of X is

A. $1

B. $2

C. $3

7. Suppose we have a *loaded* die which gives the outcomes 1 through 6 according to the probability distribution

X	1	2	3	4	5	6
$P(X)$	0.1	0.2	0.3	0.2	0.1	0.1

Note that for this die all outcomes are *not* equally likely as they would be if this were a fair die. If this die is rolled 6000 times, then $\bar{x}$, the sample mean of the number of spots on the 6000 rolls, should be about

A. 3.00

B. 3.30

C. 3.50

8. The weight of a medium-sized orange selected at random from a large bin of oranges at the local supermarket is a random variable with mean $\mu = 12$ ounces and standard deviation $\sigma = 1.2$ ounces. Suppose we independently pick two oranges at random from the bin. The difference in the weights of the two oranges selected (the weight of first orange minus the weight of the second orange) is a random variable with standard deviation

A. ounces

B. 1.70 ounces

C. 2.88 ounces

9. A widget manufacturer estimates that the total weekly cost in dollars C to produce x widgets is given by the linear function C(x) = 500 + 10x, where the intercept 500 represents a "fixed" cost of manufacture and the slope 10 refers to the "variable" cost of producing a certain number of widgets. Analysis of weekly widget production reveals that the number of widgets X produced in a week has mean μ_X = 200 and standard deviation s_X = 20. Then the mean and standard deviation of the weekly cost C are:

A. Mean of C = $2500, standard deviation of C = $200.

B. Mean of C = $2500, standard deviation of C = $700.

C. Mean of C = $2500, standard deviation of C = $40,000.

10. Let X = the number of times that a customer visits a grocery store during a one-week period.

Assume that the probability distribution of X is as follows:

x	0	1	2	3
p(x)	0.1	0.4	0.4	0.1

The standard deviation of x, σ_x, is approximately:

A. 1.50.

B. 0.81.

C. 0.65.