Quizizz

NAME :

CLASS :

DATE :

AP Statistics Chapter 6
18 Questions

B make/miss shot
I Shots independent of each other
N n = 40
S p = .38 for each

1. Which of the following could be considered binomial experiments?
I. On each shot, a basketball player's chance of scoring a free throw is estimated to be 0.38. The player tried 40 shots and the number of baskets is recorded.
II. On a specific island, it has been determined that the probability is 0.12 that an inhabitant carries a certain defective gene. Inhabitants are tested until 10 with the defective gene are found. Geometric
III. For a certain spinner, P(red) = 1/3, P(green) = 1/4, and P(blue) = 5/12. The spinner is spun 100 times and the number of each color is recorded. Not binary (Not 2 possible outcomes on each trial)

A I only
B I, II, and III
C I and II
D I and III

2. On a physical fitness test middle school boys are awarded one point for each push-up they can do, and a point for each sit-up. National results showed that boys average 18 pushups with a standard deviation of 4 push-ups, and 34 sit-ups with standard deviation of 11. The mean of their combined (total) scores was therefore 18 + 34 = 52 points. If we assume number of push-ups and number of sit-ups are independent, what is the standard deviation of the combined scores? (Hint: use your purple sheet)

Add the variances!

$\sigma_{x+y} = \sqrt{\sigma_x^2 + \sigma_y^2}$
$= \sqrt{4^2 + 11^2}$

A 11.7
B 15
C It cannot be determine
D 5.3

3. Binomial and geometric probability situation share all of the following conditions except one. Identify the choice that is not shared.

B I N S

B I S

A The probability of success on each trial is the same.
B The focus of the problem is the number of successes in a given number of trials.
C There are only two outcomes.
D The probability of a success equals 1 minus the probability of a failure.

?

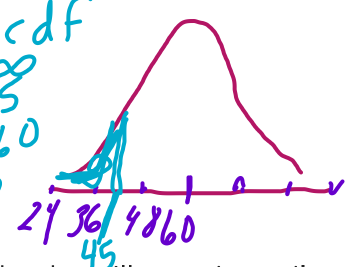
4. Which of the following random variables should be considered continuous?

Discrete (Can't have part of a car)

- A The number of brothers a randomly chosen person has
- B The number of cars owned by a randomly chosen adult male
- C The time it takes a randomly chosen woman to run 100 meters
- D The number of orders received by a mail order company in a randomly chosen week

5. The weight of reports produced in a certain department has a Normal distribution with mean 60g and standard deviation 12g. What is the probability that the next report will weigh less than 45g?

normalcdf
lb $-\infty$
ub 45
mean 60
sd 12



- A 0.1056
- B 0.0418
- C 0.3944
- D 0.1042

6. Devin is playing an instant lottery game. What is the probability that he will not win until the 8th try if the probability of winning is one out of 100 on a single try?

- A 0.0093
- B 0.0009
- C 0.9321
- D 0.0933

7. A popular computer card game keeps track of the number of games played and the number of games won on that computer. The cards are shuffled before each game, so the outcome of the game is independent from one game to the next and is based on the skill of the player. Let X represent the number of games that have been won out of 100 games. Under which of the following situations would X be a binomial random variable?

X p not the same for each game

- A A group of 5 players of different skill levels were each allowed to play 20 games in a row.
- B All games were played by the same player, whose skill improved over the course of the 100 games.

X p changes

- C A group of players of different skill levels were each allowed to play until they had lost 3 games and this resulted in 100 games played
- D Two players of equal skill level each played one game a day for 50 days and their skill level did not change from day to day

X Not fixed # trials

p stays the same

8. Let X represent the number on the face that lands up when a fair six-sided number cube is tossed. The expected value of X is 3.5 and the standard deviation of X is approximately 1.708. Two fair six-sided number cubes will be tossed, and the numbers appearing on the faces that land up will be added. Which of the following values is closest to the standard deviation of the resulting sum? (Hint: Use your purple sheet)

Add the variances.

$$\sigma = \sqrt{\underbrace{1.708^2}_{\text{Variance for 1st die}} + \underbrace{1.708^2}_{\text{Variance for 2nd die}}}$$

- A 2.415
- B 3.416
- C 1.708
- D 1.848

9. In a particular game, a fair die is tossed. If the number of spots showing is either 4 or 5 you win \$1, if the number of spots showing is 6 you win \$4 and if the number of spots showing is 1, 2 or 3, you win nothing. Let X be the amount you win. What is the expected value of X? (Hint: Make a table for the probability distribution)

X	0	1	4
P	$\frac{3}{6}$	$\frac{2}{6}$	$\frac{1}{6}$
	Roll 1,2,3	Roll 4 or 5	Roll 6

$\mu_x = \sum x_i p_i$

$$\mu_x = 0\left(\tfrac{3}{6}\right) + 1\left(\tfrac{2}{6}\right) + 4\left(\tfrac{1}{6}\right) = 0 + \tfrac{2}{6} + \tfrac{4}{6} = \tfrac{6}{6}$$

- A \$2.50
- B \$1
- C \$.50
- D \$4

10. In a particular game, a fair die is tossed. If the number of spots showing is either 4 or 5 you win \$1, if the number of spots showing is 6 you win \$4 and if the number of spots showing is 1, 2 or 3, you win nothing. Let X be the amount you win. What is the standard deviation of X? (Hint: Make a table with the probability distribution; see # children task)

$\sigma_x = \sqrt{\sum (x_i - \mu)^2 p_i}$

See table above

$$\sigma = \sqrt{(0-1)^2\left(\tfrac{3}{6}\right) + (1-1)^2\left(\tfrac{2}{6}\right) + (4-1)^2\left(\tfrac{1}{6}\right)}$$

- A \$1.35
- B \$1.78
- C \$1
- D \$1.41

11. The mp3 music files on Sharon's computer have a mean size of 4.0 megabytes and a standard deviation of 1.8 megabytes. She wants to create a mix of 10 of the songs for a friend. Let the random variable T = the total size (in megabytes) for 10 randomly selected songs from Sharon's computer. What is the expected value of T?

- A 10.0
- B 7.2
- C 4.0
- D 40.0

$T = X_1 + X_2 + \dots + X_{10}$ ← 10 individual songs.

Add the means

$$\mu_T = \mu_1 + \mu_2 + \dots + \mu_{10} = 4 + 4 + \dots + 4 = 40$$

12. The mp3 music files on Sharon's computer have a mean size of 4.0 megabytes and a standard deviation of 1.8 megabytes. She wants to create a mix of 10 of the songs for a friend. Let the random variable T = the total size (in megabytes) for 10 randomly selected songs from Sharon's computer. What is the standard deviation of T (assume the lengths of the songs are independent)?

Add the variances!

- A 18.0
- B 5.69
- C 3.24
- D 1.8

$\sigma = \sqrt{\underbrace{1.8^2 + 1.8^2 + \dots + 1.8^2}_{10 \text{ songs}}}$

13. A worn out bottling machine does not properly apply caps to 5% of the bottles it fills. If you randomly select 20 bottles from those produced by this machine, what is the approximate probability that exactly 2 caps have been improperly applied?

Binomial
$n = 20$
$p = .05$

- A .74
- B 0.0002
- C 0.19
- D .081

$P(X=2) = \binom{20}{2}(.05)^2(.95)^{18}$

2 are defective

18 are not

14. A worn out bottling machine does not properly apply caps to 5% of the bottles it fills. If you randomly select 20 bottles from those produced by this machine, what is the approximate probability that between 2 and 6 (inclusive) caps have been improperly applied?

binomial cdf

$P(2 \le X \le 6) =$
$\binom{20}{2}(.05)^2(.95)^{18} + \dots + \binom{20}{6}(.05)^6(.95)^{14}$

- A 0.19
- B 0.74
- C 0.26
- D 0.38

15. A worn out bottling machine does not properly apply caps to 5% of the bottles it fills. In a production run of 800 bottles, what is the expected number of bottles with improperly applied caps?

Binomial $n = 800$
$p = .05$

$\mu = np$
$= 800(.05)$

- A 40
- B 4
- C 50
- D 8

16. A worn out bottling machine does not properly apply caps to 5% of the bottles it fills. In a production run of 800 bottles, what is the standard deviation for the number of bottles with improperly applied caps?

Binomial
$n = 800$
$p = .05$

- A 1.38
- B 6.32
- C 6.89
- D 6.16

$\sigma = \sqrt{np(1-p)}$
$= \sqrt{800(.05)(.95)}$

$p = .80$

17. A college basketball player makes 80% of her free throws. Suppose this probability is the same for each free throw she attempts, and free throw attempts are independent. The probability that she makes all of her first four free throws and then misses her fifth attempt this season is

make make make make miss

$(.80)(.80)(.80)(.80)(.20)$

A 0.06554

B 0.08192

C 0.32768

D 0.00128

18. A college basketball player makes 80% of her free throws. Suppose this probability is the same for each free throw she attempts, and free throw attempts are independent. The expected number of free throws required until she makes her first free throw this season is

mean

Geometric

$\mu = \frac{1}{p} = \frac{1}{.80}$

A 1.25

B 0.8

C 0.31

D 2

Answer Key

1.a	2.a	3.b	4.c
5.a	6.a	7.d	8.a
9.b	10.d	11.d	12.b
13.c	14.c	15.a	16.d
17.b	18.a		