Topics Covered

* Making inferences and justifying conclusions
* Conditional probability model and determine probabilities of events by the rules.
* Probability of a compound event

Standards

7.SP.1: Probability techniques of data-generating process to create model.

* Medium Emphasis
* Example: From a group of 12 employees, 3 workers are to be randomly selected to serve on a safety advisory panel. Which sampling method is most likely to result in a random sample?

7.SP.7a: Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.

* Low Emphasis
* Example: There are 8 boys and 6 girls in a class. When a student is selected at random, what is the probability that the student is a girl?
* Example: Based on the spinner shown, what is the probability of the spinner landing on blue?

7.SP.8a: Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. (Aligns closely to S.CP.7.)

* Low Emphasis
* Example: What is the probability of getting heads and rolling a 5?
* Example: When two students are selected at random, what is the probability that one is a man and that the other is a woman?

7.SP.8b: Represent sample spaces for compound events using methods such as organized lists, tables, and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.

* Low Emphasis
* Example: How many possible outcomes are there…
* Example: Given the sample space listed, how many ways are there to get…

**Answer Key**

Note: constructed response and long response question distribution will vary.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| # | Correct | # | Correct | # | Correct | # | Correct | # | Correct | # | Correct | # | Correct | # | Correct |
| 1 | C | 4 | C | 7 | B | 10 | D | 13 | C | 16 | C | 19 | A | 22 | 1/2 |
| 2 | D | 5 | A | 8 | C | 11 | A | 14 | C | 17 | D | 20 | D |  |  |
| 3 | D | 6 | C | 9 | A | 12 | C | 15 | B | 18 | C | 21 | $$\frac{1}{6}$$ |  |  |

21. Rubric

If Laquisha can enter school by any one of three doors ( D1, D2, D3) and the school has two staircases (S1, S2) to the second floor, What is the probability that Laquisha enter the first door but the second staircase? Justify your answer by drawing a tree diagram or listing a sample space.

2-Points Examinee shows possible data-generating processes by one of the techniques, locate the specific outcome, and show the probability.

Sample Answer: 1/6



Sample Explanation: Refer to the tree diagram above

22. The probability that it will snow on Sunday is 3:5 . The probability that it will snow on both Sunday and Monday is 3:10. What is the probability that it will snow on Monday, if it snowed on Sunday? Show your steps in getting the answer.

2-Point

Examinee shows possible data-generating processes by one of the techniques, locate the specific outcome, and show the probability.

Explanation Under Construction.

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. A jar contains 3 red marbles, 7 green marbles and 10 blue marbles. What is the probability of selecting two blue marbles in a row if the first marble is not replaced?
2. 0
3. $\frac{49}{400}$
4. $\frac{9}{38}$
5. 1
6. The letters of “Mathematics” are all written on separate cards. What is the probability of selecting an A followed by M if the cards are not replaced?
7. 0%
8. 100%
9. 3.64
10. $3.64\%$
11. The table shows the transportation method used by the teachers to commute to school. What is relative frequency that a teacher commutes by car?

|  |  |
| --- | --- |
| Transportation | Number |
| car | 8 |
| bus | 7 |
| walk | 5 |

1. 0.12
2. 0.16
3. 0.33
4. 0.40

Answer #4-#6 using the Venn Diagrams below. The Venn Diagrams below shows the number of people that belong to a book club (B) and cooking club (C) in a high school.



4. Find the probability of picking someone randomly from the cooking club.

1. 2/50
2. 16/50
3. 18/50
4. 24/50

5. What is the probability of choosing a person that belongs to both the book club and the cooking club?

1. 2/50
2. 16/50
3. 18/50
4. 24/50

6. What is the chance of picking a person from either the book club or the cooking club?

1. 24/50
2. 40/50
3. 42/50
4. 50/50

**7.**  A cube, with faces numbered 1 to 6, is rolled, and a penny is tossed at the same time. How many elements in the sample space consist of an even number and a tail?

1. 12
2. 2
3. 3
4. 4

8. Suppose the first step of a probability experiment is to pick one number from the set {1,2,3}. The second set is to pick one number from the set {1,4,9}. What is the probability that the second number is the square of the first?

1. $\frac{1}{9}$
2. $\frac{2}{9}$
3. $\frac{3}{9}$
4. $\frac{2}{27}$

9. A spinner is divided into eight equal regions as shown in the diagram below:



Which event is most likely to occur in one spin?

1. The arrow will land in a yellow or green area.
2. The arrow will land in a yellow or black are
3. The arrow will land in a green or black area.
4. The arrow will land in a green or white area.

10. Out of 60 students in seventh grade at Way Beyond High School, 25 take art only, 18 take music only, and 9 do not take either art or music. The Venn Diagram of this is shown below:



What is the probability that a student takes both art and music?

A. $\frac{52}{60}$

B. $\frac{50}{60}$

 C. $\frac{41}{60}$

 D. $\frac{8}{60}$

11. The probability that a student selects philosophy class is $\frac{1 }{3}$ . The probability that the same student selects philosophy and mathematics is $\frac{2}{15}$. Determine the probability that they select mathematics.

A. $\frac{2}{5}$

B. $\frac{2}{45}$

 C. $\frac{15}{45}$

 D. $\frac{8}{45}$

12. A student council has seven officers, of which five are girls and two are boys. If two officers are chosen at random to attend a meeting with the principal, what is the probability that the first officer chosen is a girl and the second is a boy?

A. $\frac{2}{42}$

B. $\frac{5}{42}$

 C. $\frac{10}{42}$

 D. $\frac{10}{49}$

13. At a school fair, the spinner represented in the accompanying diagram is spun twice. What is the probability that it will land in section G the first time and then in section B the second time?



A. $\frac{1}{2}$

B. $\frac{1}{4}$

 C. $\frac{1}{8}$

 D. $\frac{1}{16}$14. Throughout history, many people have contributed to the development of mathematics. These mathematicians include Pythagoras, Euclid, Hypatia, Euler, Einstein, Agnesi, Fibonacci, and Pascal. What is the probability that a mathematician’s name selected at random from those listed will start with either the letter E or the letter A?

A. $\frac{2}{8}$

B. $\frac{3}{8}$

 C. $\frac{4}{8}$

 D. $\frac{6}{8}$

15. The faces of a cube are numbered from 1 to 6. If the cube is tossed once, what is the probability that a prime number or a number divisible by 2 is obtained?

A. $\frac{6}{6}$

B. $\frac{5}{6}$

 C. $\frac{4}{6}$

 D. $\frac{1}{6}$

16. Manpreet has three fair coins. Find the probability that he gets two heads and one tail when he flips the three coins

A. $\frac{1}{8}$

B. $\frac{2}{8}$

 C. $\frac{3}{8}$

 D. $\frac{4}{\begin{array}{c}8\\\end{array}}$

17. A spinner that has 3 sections of equal area, numbered from 1 to 3, is spun two times in succession. Find the sample space composed of equally likely events. Which of the following is/are not part of the sample space?

I. (1, 1) II. (3, 4) III. (2, 3) IV. (3, 2)

1. All of the outcomes are possible
2. I only
3. I and II only
4. II only

18. Bob and Laquisha have volunteered to serve on the Junior Prom Committee. The names of twenty volunteers, including Bob and Laquisha, are put into a bowl. If two names are randomly drawn from the bowl without replacement, what is the probability that Bob’s name will be drawn first and Laquisha’s name will be drawn second?

1. $\frac{1}{400 }$
2. $\frac{2}{400 }$
3. $\frac{1}{380 }$
4. $\frac{2}{20 ! }$

19. A coin is tossed. If a head appears, a spinner that can land on any of the numbers from 1 to 6 is spun. If a tail appears, the coin is tossed a second time instead of spinning the spinner. Which outcomes are possible?

1. (T, H), (T, T), (H, 1), (H, 2), (H, 3), (H, 4), (H, 5), (H, 6)
2. (T, H), (T, T), (T, 1), (T, 2), (T, 3), (T, 4), (T, 5), (T, 6)
3. (T, H), (H, H), (H, 1), (H, 2), (H, 3), (H, 4), (H, 5), (H, 6)
4. (T, H), (H, H), (T, 1), (T, 2), (T, 3), (T, 4), (T, 5), (T, 6)

20. Identify the mutually exclusive events.

1. on Election day, Sue votes, Mya doesn't vote
2. on Election day, Mya votes, Sue doesn't vote
3. on Election day, Sue votes, Mya votes
4. on Election day, Sue votes, Sue doesn't vote

21. If Laquisha can enter school by any one of three doors ( D1, D2, D3) and the school has two staircases (S1, S2) to the second floor. What is the probability that Laquisha enters through door D1 and takes staircase S2? Justify your answer by drawing a tree diagram or listing a sample space.

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22. The probability that it will snow on Sunday is 3:5 . The probability that it will snow on both Sunday and Monday is 3:10. What is the probability that it will snow on Monday, if it snowed on Sunday? Show your steps in getting the answer.

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