Assign 5 Probability Independent Events

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Name:_____   Date:_____

Probability with Independent Events

1. If a ~~bag~~ **BAG** contains 5 blue marbles, 3 red marbles, and 2 green marbles, in a single draw what is the probability of drawing a red marble? Express your answer as a common fraction?

5B
3R
2G

$\dfrac{3}{10}$

2. What is the probability of getting a number greater than two on a single toss of a fair cubical die? Express your answer as a common fraction?

$\cancel{1}\,\cancel{2}\,3\,4\,\cancel{5}\,6$ $\dfrac{4}{6}=\dfrac{2}{3}$

3. A fair cubical die is tossed twice. What is the probability that a prime number will show on the first toss and an even number on the second toss? Express your answer as a common fraction?

$\boxed{2,3,5}$ $\boxed{2,4,6}$ NOTE: 1 IS NOT PRIME

$\dfrac{1}{2} \times \dfrac{1}{2} = \dfrac{1}{4}$

4. The integers 1 through 20 inclusive are written on cards, one integer per card. If the cards are shuffled and you are dealt one card, replaced it, and then dealt a second card, what is the probability that they will both be prime numbers? Give the answer as a common fraction?

1 ②③ 4⑤ 6 ⑦ 8 9 10 ⑪ 12 ⑬ 14 15 16 ⑰ 18 ⑲ 20 = $\dfrac{8}{20}$

$\dfrac{8}{20} \times \dfrac{8}{20}$

$\dfrac{2}{5} \times \dfrac{2}{5} = \dfrac{4}{25}$ //

5. What is the probability of rolling a seven as a sum of the dots on two fair dice? Express your answer as a common fraction?

$\dfrac{1}{6}$

6. A bag contains at least 20 marbles, each of which is either red, green, or blue. The probability of drawing a red marble from the bag is 2/3. The probability of drawing a green marble is 5/18. There are 4 blue marbles. How many red marbles are there?

$$R: 2/3 = 12/18 = \boxed{48}/72$$
$$G: = 5/18 = 20/72$$
$$B: = 1/18 = 4/72$$

7. The probability of having rain is 1/4 . The probability of having homework is 5/6. What is the probability of having no rain but having homework? Express your answer as a common fraction?

$$P(\text{RAIN}) = 1/4 \qquad P(\text{hw}) = 5/6$$
$$P(\overline{\text{RAIN}}) = 3/4 \qquad P(\overline{\text{Hw}}) = 1/6$$

$$P(\overline{\text{RAIN}}) \times P(\text{hw})$$
$$= \frac{3}{4} \times \frac{5}{6} = \frac{5}{8}$$

8. A game is played in which a random two-digit number is generated. You win the game if the result is divisible by 7 or contains a 7. What is the probability that you win? Express your answer as a common fraction?

$$P(\text{Multi of 7}) = 13/90 \qquad P(\text{contain 7}) = 18/90 \qquad P(\text{both}) = 2. \qquad P(\text{or}) = \frac{13}{90} + \frac{18}{90} - \frac{2}{90}$$
$$7(2) \cdots\cdots 7(14) \qquad\qquad 7 \underline{\times} \to 10 \qquad\qquad 70,77 \qquad\qquad = \frac{31}{90} - \frac{2}{90}$$
$$14 - 2 + 1 = 13 \qquad\qquad \underline{\times 7} \to 9 \qquad\qquad\qquad = 29/90$$
$$10 + 9 - 1 = \boxed{18}$$

9. A penny is tossed three times, what is the probability that you will get exactly 2 heads from the 3 tosses?

$$\left.\begin{array}{l} HHT \\ HTH \\ THH \end{array}\right\} \ 3/8$$

10. If the probability of a computer being defective is 0.02 and of a software diskette being defective is 0.05, what is the probability, expressed as a decimal, that neither is defective?

• ASSUME INDEPENDENCE.

$$P(\text{NOT DEFECTIVE}) = 1 - 0.02 \qquad P\left(\begin{array}{c}\text{DISK NOT}\\\text{DEFECTIVE}\end{array}\right) = 1 - 0.05$$
$$\text{comp} \qquad\qquad = 0.998 \qquad\qquad\qquad = 0.995$$

$$P\left(\begin{array}{c}\text{BOTH NOT}\\\text{DEFECTIVE}\end{array}\right) = 0.998 \times 0.995$$
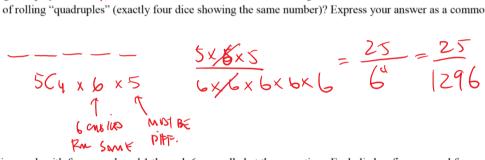$$= \underline{\qquad\qquad}$$

11. A television remote control has eleven buttons: 10 buttons with the number 0-9 on them and an on/off button. An infant is playing with the remote control and presses three buttons at random. Given that the television is initially off and when turned on it is on channel 03, what is the probability, expressed as a common fraction, that the infant will turn the television on and then turn the televisino to channel 12?

$$\frac{1}{11} \times \frac{1}{11} \times \frac{1}{11} = \frac{1}{11^3} = \frac{1}{1331}$$

(ON) (PRESS1) (PRESS2)

12. What is the probability that the first five cards drawn at random from a standard deck of playing cards will be red if each card is replaced after it is drawn? Express your answer as a common fraction.
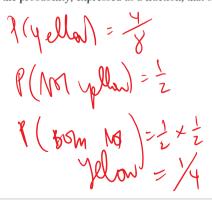
$$\left(\frac{1}{2}\right)^5 = \frac{1}{32}$$

13. In a certain game, players throw (5) standard 6-sided dice at one time. On a single throw of the 5 dice, what is the probability of rolling "quadruples" (exactly four dice showing the same number)? Express your answer as a common fraction.

$$5C_4 \times 6 \times 5 \qquad \frac{5 \times 6 \times 5}{6 \times 6 \times 6 \times 6 \times 6} = \frac{25}{6^4} = \frac{25}{1296}$$

6 ons for Ru Same   MUST BE DIFF.

14. Two fair dice, each with faces numbered 1 through 6, are rolled at the same time. Each die has five exposed faces, which are summed. Express as a common fraction the probability that the least common multiple of the sums of the exposed faces is a multiple of 6.

Cov.	Sums:
1	20
2	19
3	18
4	17
5	16
6	15

	20	19	18	17	16	15
20			✓		✓	
19						
18	✓	✓	✓	✓	✓	✓
17			✓			
16			✓			✓
15	✓			✓		

$$= \frac{15}{36}$$

= 5/12

15. There are eight golf balls a bag: 1 orange, 4 yellow, and 3 white. Two ball are drawn one after another with replacement. What is the probability, expressed as a fraction, that both balls are not yellow?

$$P(\text{yellow}) = \frac{4}{8}$$

$$P(\text{NOT yellow}) = \frac{1}{2}$$

$$P\left(\text{both NO yellow}\right) = \frac{1}{2} \times \frac{1}{2} = 1/4$$

16. If 30% of school's student body has blue eyes and 25% is left-handed, what is the probability, expressed as a common fraction, that a student is both blue-eyed and left-handed?

*Assume INDEP

$$P(A) \times P(B) = P(A \& B)$$

$$0.3 \times 0.25 = 0.075$$

$$= \frac{75}{100} = \frac{3}{40}$$

17. What is the probability, expressed as a common fraction, that exactly two heads will come up when three coins are flipped?

$$\frac{3}{8}$$

18. Deb has a 1/5 chance of hitting a bull's-eye with one dart. If she tosses 5 darts, express as a terminating decimal the probabilty that she will hit a least one bullseye.

$$P(\text{No Bulls eye}) = \left(\frac{4}{5}\right)^5$$

$$= \frac{1024}{5^5}$$

$$P(\text{ATLEAST ONE}) = 1 - \left(\frac{4}{5}\right)^5$$