

Secondary Math II

Unit 11 Review (Green)

1. Riley entered a contest along with 50 other people. 4 will be picked at random to receive a coupon for a free ice cream cone. What is the probability that Riley will not be picked to receive the free ice cream?

$$P = \frac{\text{event}}{\text{total}} = \frac{4}{51} \quad \text{win} \quad 51 - 4 = 47$$

F, D, P

$$\frac{47}{51}$$

92%

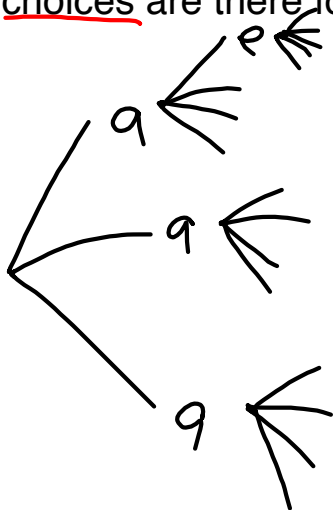
2. What is the probability of rolling a number less than 5 on a single roll of a number cube?

1, 2, 3, 4

$$\frac{4}{6} = \boxed{\frac{2}{3}}$$

50% 60%
0.5 0.66

3. A cafe's lunch special offers 3 different appetizers, 4 different entrées and 5 different choices of soda. How many different choices are there for ordering 1 of each?



$$3 \cdot 4 \cdot 5 = \boxed{60}$$

4. How many different arrangements can be made from the word *valentine*?

val
lav

order matters - P

$n! \rightarrow \text{total}$

$r_1! \cdot r_2! \dots$

↓
duplicates

$$9! = 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$$

~~Valentine~~

9!

$(2! \cdot 2!)$

90,720

5. Find

${}_7P_3$

and

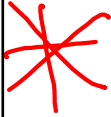
${}_7C_3$

↓
210

↓
35

6. What is the formula for

${}_n P_r$ and ${}_n C_r$?

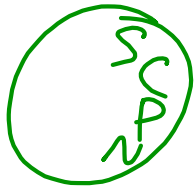


$n = \text{total}$
 $r = \text{want}$

$$\frac{n!}{(n-r)!}$$

$$\frac{n!}{r!(n-r)!}$$

7. How many ways can 8 spices be placed on a circular tray?



$n = \text{total}$

Permutation

$$(n-1)!$$

$$(8-1)! = 7!$$

5,040

8. If $P(A) = \frac{3}{7}$ and $P(A \text{ and } B) = \frac{5}{14}$,
find $P(B|A)$

'B given A'

$$P(B|A) = \frac{P(A \text{ and } B)}{P(A)} = \frac{\frac{5}{14}}{\frac{3}{7}}$$

$$\frac{5}{14} \div \frac{3}{7} = \frac{5}{2 \cancel{14}} \cdot \frac{7}{3} = \boxed{\frac{5}{6}}$$

10. Find the number of district committee's that can be formed if 8 people are selected from a group of 12. Leave in factorial form.

$$\begin{matrix} n \\ \text{total} \end{matrix} C_{\begin{matrix} r \\ \text{want} \end{matrix}} = \frac{n!}{r!(n-r)!}$$

$$\begin{matrix} 12 \\ n \end{matrix} C_{\begin{matrix} 8 \\ r \end{matrix}} = \frac{12!}{8!(12-8)!} = \boxed{\frac{12!}{8!4!}}$$

11. If 2 marbles are randomly taken from a bag of 5 white and 3 green marbles, what is the probability of drawing a white one and a green one?

$$P = \frac{\text{event}}{\text{total}} \rightarrow 1W, 1G$$

$$= \frac{(5C_1 \cdot 3C_1)}{8C_2}$$

GW }
WG } C

$$= \frac{5 \cdot 3}{28} = 53.6\%$$

12. A spinner that is labeled equally 1 – 8 and a coin are each spun and tossed respectively. What is the probability that the spin is a 4 and the toss is a tail?

multiply
independent

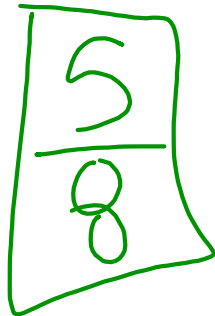
$$\frac{1}{8} \cdot \frac{1}{2} = \frac{1}{16}$$

13. The numbers 1 – 8 are put into a hat. What is the probability of selecting the number 3 or 5?

$$\frac{2}{8} = \frac{1}{4}$$

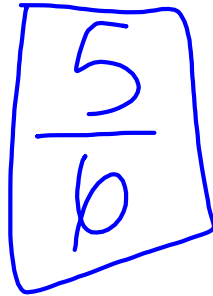
14. Find the probability that the spinner that is equally divided into 1 – 8 will land on 4 or less than 6?

4, 5, ~~6~~, 3, 2, 1



15. Find the probability of rolling less than 5 or a prime number on one toss of a number cube.

4, 3, 2, 1, 5



OR

mutually exclusive



can't happen @ same time

1 or even

inclusive



can happen @ same time

3 or odd

16. If $P(A^c) = \frac{3}{13}$ find $P(A)$

$$1 - \text{given} = \text{want}$$

$$\frac{1}{13} - \frac{3}{13} = \frac{13}{13} - \frac{3}{13} = \frac{10}{13}$$

17. Without replacement, find the probability of drawing first a blue and then second a red from a bag of 8 red, 9 yellow and 5 blue beads.

don't put it
back

$$\frac{5}{22} \cdot \frac{8}{21} = \frac{20}{231}$$

18. Find the probability of at least 2 heads in 3 tosses of a coin.

$$2 \cdot 2 \cdot 2 = 8$$

$$2^3$$

HHH HHT HTH HTT
 TTT THT TTH TTH

$$\frac{4}{8} = \frac{1}{2}$$

19. You flipped a coin 8 times and they were all heads. What is the probability that the next flip will be a head?

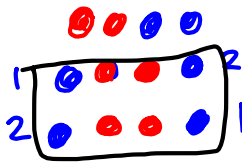
$$\frac{1}{2}$$

20. How many 3 letters followed by a 3 number passwords can there be if only even numbers can be used. Remember that 0 is neither odd or even.

$$\underbrace{26 \cdot 26 \cdot 26}_{\text{letters}} \cdot \underbrace{4 \cdot 4 \cdot 4}_{\substack{\text{\#}'s \\ 2/4/6/8}} = 1,124,864$$

21. How many ways can you arrange 5 red, 2 blue and 6 yellow tulips in a row?

order matters - P



$$\frac{n!}{r_1! r_2! \dots \text{duplicates}}$$

$$\frac{13!}{(5! 2! 6!)} = 36,036$$

22. If

 $P(A^c) = \frac{4}{9}$, find $P(A)$.

$$1 - \frac{4}{9} = \boxed{\frac{5}{9}}$$