

1. Daniel and co. (Shawn, Roger, and Lily) are sitting at a round table to discuss their options on how to explore the beautiful prairie. How many distinct ways are there to arrange Daniel and all of his cronies if rotations are considered to be equivalent?

In order to calculate the ways to arrange people around a circular table, you follow the formula $(n - 1)!$, so, in this case, $4 - 1 = 3$, and $3!$ is 6, so the answer is $\boxed{B, 6}$.

2. Daniel was embracing his inner Dora when he spotted a beautiful pronghorn! How many ways are there to arrange the letters in "pronghorn"?

In order to find how many ways the letters can be arranged, we first find how many letters there are, in this case, 9. Then we take the factorial of this number, 362,880. However, there are 2 r's, 2 o's, and 2 n's, so we divide by 2 3 times, getting a final answer of $\boxed{E, 45360}$.

3. Oh no! Lily has angered the pronghorn! If the pronghorn is charging at Lily with a constant speed of 20 feet a second, and Lily and the pronghorn are 130 yards apart, how many seconds will it take for them to collide? Round up to the nearest whole number. (Assume Lily doesn't move.)

First, we convert 130 yards into feet. Since 3 feet = 1 yard, this is equal to 390 feet. Now we divide by 20, getting an answer of 19.5. However, the question instructs you to round up to the nearest whole number, so the final answer is $\boxed{C, 20}$.

4. Daniel begins to laugh at Lily so hard that he rolls down the hill! If he starts at the point (9, 10) and rolls to (6, 1), what is the slope of the hill?

To calculate the slope, we use the formula $\frac{y_2 - y_1}{x_2 - x_1}$, so in this case we would get $\frac{1 - 10}{6 - 9} = \frac{-9}{-3} = \boxed{A, 3}$.

5. Uh-oh. A coyote spotted Daniel! The coyote tells him he must get this question right in order to escape: Let $a \star b = 3a + 4b - 2ab$. What is $5 \star 3$? Assuming Daniel got it right, what did he say?

Plugging in 5 and 3 for a and b respectively would lead to the expression

$$5 \star 3 = 3 \cdot 5 + 4 \cdot 3 - 2 \cdot 5 \cdot 3 = 15 + 12 - 30 = \boxed{D, -3}.$$

6. However, the coyote tricked him! The coyote demands x amount of treats from Daniel. If the amount of treats equals the positive solution of $3x^2 + 9x - 12 = 0$. How many treats should Daniel give the dog?

First, you divide by 3 to get $x^2 + 3x - 4 = 0$. By factoring, you can solve the equation to $(x + 4)(x - 1) = 0$. Seeing this, the roots are $\{-4, 1\}$, but since the question asks for the positive solution, it is $\boxed{B, 1}$.

7. Meanwhile, Shawn is reading a book about the prairie ecosystem. If the book has pages numbered 1 – 99, what is the sum of all the page numbers in his book?

To solve this quickly, we can see that $1 + 99 = 100$, $2 + 98 = 100$, and so on until you reach 50. This means that there are 49 sets of 100 and 1 set of 50. Adding these up you get $\boxed{A, 4950}$.

8. If $45 - 3x \geq 120$, which of the following statements is true?

Just from simplifying, you get $-3x \geq 75$, then the answer, $\boxed{E, x \leq -25}$.

9. What is the sum of the prime factor(s) of 512 if we allow for repetition? For example, the sum of the prime factors of 9 would be $3 + 3 = 6$ since $9 = 3^2$.

The prime factorization of 512 is 2^9 , or 9 2s. Adding these together, you get a total of $\boxed{A, 18}$.

10. Shawn learns that prairies once covered about 40% of the United States! What is 40% expressed as a fraction in simplest form?

40% can also be written as $\frac{4}{10}$, or $\boxed{D, \frac{2}{5}}$.

11. Daniel and co. see a group of prairie dogs! If their relative position x to the closest dog satisfies $0 = 3x^3 + x^2 + 2$, what is x ?

Testing the answer choices gives that $3(-1)^3 + (-1)^2 + 2 = 0$, so the answer is $\boxed{A, -1}$.

12. Lily wants a prairie dog. To get a prairie dog, she has to roll a 10 on a fair 10-sided die. How many rolls on average would it take for her to get a prairie dog?

Lily has a $\frac{1}{10}$ chance of rolling a 10, so it will take her an average of $\frac{1}{1/10} = \boxed{A, 10}$ rolls to roll a 10.

13. The prairie is getting hot! If on Friday the temperature is 80° and the temperature increases 10% every day, what will the temperature be on Monday? (All units are in Fahrenheit).

Increasing by 10% every day is equal to multiplying by 1.1 each day. Monday is 3 days after Friday, so the answer is $80 \cdot 1.1^3 = \boxed{D, 106.48^\circ}$.

14. Lily has gotten absolutely trucked by the pronghorn! The doctor says to sleep a number of hours equal to the least common multiple of 28 and 72. How many hours should Lily sleep?

First, we need to write 28 and 72 in prime factorization. 28 is equal to $2^2 \times 7$ and 72 is equal to $2^3 \times 3^2$. You can see that both numbers need 2^2 , or 4, as well as 7 (from the 28), the extra 2 (from the 72, and 9 (also from the 72). Multiplying $4 \times 2 \times 7 \times 9$ gets you the answer of $\boxed{D, 504}$.

15. Lily wants to bring the prairie dog home. Assuming her house is at $(-1, -1)$ and she is currently at $(6, 7)$, what is the least distance it will take for her to go home?

Plugging the coordinates into the distance formula,

$$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2} = \sqrt{(-1 - 6)^2 + (-1 - 7)^2} = \sqrt{(-7)^2 + (-8)^2} = \sqrt{49 + 64} = \boxed{C, \sqrt{113}}.$$

16. Lily wants to go to the river at $y = -3$ on her way home. What is the least distance Lily can take to visit the river on her way home? Use the same locations as the last problem.

Using the same coordinates from problem 16, you can reflect the first point, $(-1, -1)$ on the line $y = -3$ to get $(-1, -5)$. Then you calculate using the distance formula, (stated above) to get $\boxed{E, \sqrt{193}}$.

17. Once home, Lily wants to dress her prairie dog up. She has 3 hoodies, 2 pairs of pants, and 6 socks. Each prairie dog needs a hoodie, 1 pair of pants, and 3 socks. How many unique ways to dress her prairie dog?

She has 3 choices for a hoodie, 2 choices for a pair of pants, and 6 choices for socks. Since a prairie dog needs 3 socks, the amount of ways to choose three from 6 is $\binom{6}{3}$ or $\frac{6!}{3!3!} = \frac{720}{6 \cdot 6}$. Simplifying, we get 20. Now, we multiply everything together and get $3 \cdot 2 \cdot 20 = \boxed{B, 120}$.

18. Daniel throws a prairie dog that follows the trajectory of $y = -x^2 + 2x + 8$. With x the prairie dog's relative distance to Daniel in dozens of feet and y representing the height of the prairie dog in feet. If the prairie dog starts and ends at height 0 and travels a nonzero distance, how many feet away from Daniel does the prairie dog touch the ground?

To solve this equation, we first make $y = 0$, making the equation $0 = -x^2 + 2x + 8$. Then, dividing by -1 in order to make the coefficient of x positive, we get $0 = x^2 - 2x - 8$. By factorizing, we get $(x - 4)(x + 2) = 0$. The roots would be 4 and -2 , but Daniel is standing at $(-2, 0)$, so the prairie dog must land at $x = 4$, however, x is in dozens of feet, while the answer asks for feet, thus the answer would be 48. However, the question says Daniel is located at $(-2, 0)$, so adding back the 24 feet from his position, the distance is $\boxed{E, 72}$.

19. Daniel realizes how talented he is and is drafted as the 11th pick in the 2030 NFL draft. What is the 11th prime number?

The 11th prime number is $\boxed{C, 31}$.

20. On his way to watch the Buffalo Bills (the team the Seattle Seahawks beat in the Super Bowl) game, Daniel sees Aaron playing in an NBA game with LeBron James and Austin Reaves. Aaron was the 8th pick in the 2025 NBA draft. What's the 8th triangular number?

The triangular number formula is $\frac{n(n+1)}{2}$. Plugging in 8 as n , we get $\frac{8(9)}{2}$, which equals $\boxed{A, 36}$.

21. Daniel sees a buffalo on the way to New York! If there are 3 buffaloes in a herd and there are 3 herds, how many ways are there to order the buffaloes in a line if the buffaloes within each herd must stay together?

If there are 3 buffaloes in a herd, then there are $3! = 6$ ways to organize them. Since there are 3 herds, we have to cube this number, getting 216. But the order of the 3 herds can still be switched around, so we multiply by another 6 getting $\boxed{D, 1296}$.

22. On the way to the Seattle Seahawks, Lily is also passing through the prairie (in the opposite way as Daniel) and spotted George the Monkey! George has a standard 8×8 chessboard. How many rectangles can be made using the squares on the chessboard?

A chess board is made up of 9 lines by 9 lines. Since a rectangle is made of 2 lines horizontally and 2 lines vertically, we can use the choose function and get $\binom{9}{2}\binom{9}{2} = \boxed{D, 1296}$.

23. George the Monkey also has prairie dogs following him and typing his English essay for him (don't do this). Roger (prairie dog 1) can type a sentence in 4 minutes and Shawn (prairie dog 2) can type 2 sentences in 5 minutes. How many sentences can they type in 20 minutes?

If Roger can type 1 sentence in 4 minutes, multiply everything by 5 to get the amount of sentences typed in 20 minutes. We get that Roger can type 5 sentences in 20 minutes. Now, if Shawn can type 2 sentences in 5 minutes, then we multiply everything by 4 to get the amount of sentences typed in 20 minutes. We get that Shawn can type 8 sentences in 20 minutes. Adding 5 and 8 together, we get $\boxed{C, 13}$.

24. The word prairie originates from the Latin word "pratum," meaning meadow. If a is a natural number that is equal to the square of itself, what is the value of x that satisfies $ax^2 - 2x + 2 = 1$?

The only natural number that is equal to the square of itself is 1. (0 isn't a natural number). Therefore, plugging in 1 for a , we get $x^2 - 2x + 2 = 1$, subtracting 1 from both sides to get $x^2 - 2x + 1 = 0$. We can factor this to get $(x - 1)^2 = 0$. Hence, x is $\boxed{C, 1}$.

25. If 20 plant species support 3 bird species, 4 bird species support one individual prairie dog, there are 100 plant species in 5 acres of prairie, and there are 640 acres in a square mile, how many prairie dogs can a 4 mile \times 5 mile section of prairie support?

A 4 mile \times 5 mile area is 20 square miles. Multiplying that by 640, we get that there are 12,800 acres in this area. Dividing by 5, you get 2,560, however, there are 100 plant species in each of these areas, so multiplying, you get 256,000 plant species total. Now, dividing by 20, then multiplying by 3, you get 38,400 bird species, and finally, dividing by 4, you get $\boxed{A, 9600}$.

26. Prairie dogs love grass! If Tommy the prairie dog eats 1 cubic foot of grass each day, how many cubic inches of grass does he eat in 3 days?

Tommy will eat 3 cubic feet of grass in 3 days, however, we must convert that to cubic inches. Since there are 1728 cubic inches in a cubic foot, we multiply 3 by 1728 and get $\boxed{E, 5184}$.

27. Daniel is terrified of snakes! Daniel runs at x feet per second where x satisfies $\frac{7x+6}{4} = 5$. If there is a rattlesnake 24 yards away from Daniel that is chasing him at 8 feet per second, how long will Daniel last before getting caught? Assume both Daniel and the rattlesnake move in a straight line and Daniel is running away from the rattlesnake.

Solving for x , we get that Daniel runs at 2 feet per second. However, the 24 is in yards, so we convert it into feet making it 72 feet. If the rattlesnake slithers at 8 feet per second, then we can make the equation $2s + 72 = 8s$, s being the seconds that Daniel can run for. Solving for s , we get $\boxed{E, 12 \text{ seconds}}$.

28. After surviving the wonderful prairie, Daniel, Shawn, Roger, and Lily all high-five each other once. How many times did they high-five in total?

Daniel will high-five the other three members once, which is 3 high fives. Then, Shawn will high-five the other two members once since he already high-fived Daniel, adding 2 to the count. Then Roger will high-five only Lily since Daniel and Shawn have already high-fived him. And finally, Lily has no one left to high-five, so the answer is $3 + 2 + 1 = \boxed{B, 6}$.

29. Timmy and Tommy the prairie dogs are best friends, but they are arguing about who is right. Given the equation $x^2 - 3x + 2 = 0$, Timmy says x is 1, but Tommy says x is 2. Who is right?

By factoring, we get $(x - 2)(x - 1) = 0$. This gives us the two solutions, $\{1, 2\}$. Since Timmy says it's 1 and Tommy says it's 2, $\boxed{D, \text{Both are right}}$.

30. Timmy's favorite food is an avocado. How many distinct permutations of the letters in "AVOCADO" are there?

The word avocado has 7 letters, meaning there are $7!$ ways to organize the letters, however, there are 2 repeats, the A's, and the O's, so dividing 5040 by 4 will get $\boxed{B, 1260}$.