Algebra Round

30 minutes | 15 problems

1. In Angry Birds, each bird's power increases by 20 after each level. If the bird's power after 6 levels is 180, what was the bird's initial power?

2. Ash has 5 Pikachu. If Ash decides to trade in 2 of his Pikachu, gains 12 more, and loses 8, the total power points for all of his Pikachu is 217. How many power points does each Pikachu have?

3. In an Among Us game, there are 12 players on the spaceship. 3 of them are impostors, and the rest are crewmates. Let $3y$ represent the number of crewmates. If y crewmates are eliminated by the impostors, how many crewmates are still alive?

4. A skilled player in Fortnite turns 90 degrees to "crank 90s" in order to build upwards. How many degrees clockwise from a player's original start position are they if they "crank 90s" 34 times clockwise and then adjust their aim by moving 24 degrees counterclockwise?

5. Suppose $a \# b$ is the same as $a - 3b$. In exchange for your bread, a villager in Minecraft offers you X emeralds, where $5 \# (6 \# X) = 5$. How many emeralds will the villager give you - in other words, what is the value of X?

6. The internet cuts out, and you decide to play the no-wifi dinosaur game. When jumping over a cactus, the dinosaur creates the parabola $h(x) = -x^2 + 1$, where h is the height and x the distance. What positive x-value did the dinosaur land at (the positive root)?

7. In Subway Surfers, Jake's velocity can be modeled by the equation $v(t) = -\frac{6}{5}t + 30$, where t represents time in minutes. At what point in time will Jake stop running?

8. In Minecraft, you get $x^2 - y^2$ experience points for killing a wither. If $x - y = 16$ and $x + y = 4$, how many experience points do you get?

9. You are downloading Minecraft Education on your school computer and Minecraft (regular edition) on your home PC. Minecraft Education is downloading at a rate of X megabytes per second, while Minecraft (regular) is downloading at a rate of Y megabytes per second. X is 3 times more than Y. Five seconds in, you have downloaded a total (both regular and Education edition) megabyte count of 280. What is $X + Y$?

10. A slice of pizza costs $16, and a sundae $13 in Papa's Very Fancy Gourmet Pizzeria. If you went there and spent $257 on 17 items for your family and friends, how many pizza slices did you buy?

11. In Duck Life, your duck, Bob, is running at a speed of 5 miles an hour, but the other duck, Joe, is running at 8 miles an hour. However, Bob beat Joe in the previous section of the race, and when Joe starts the running section, Bob is already 6 miles ahead. Starting from when Joe starts running, how long will it take for Joe to catch up to your duck, Bob? (Bonus $\frac{1}{2}$ point if you can answer whether Joe or Bob will make it to the finish line first if the running portion is 10 miles!)

12. A player wants to figure out how much experience points she receives from making a kill. The only way to gain experience is to make assists, kills, or winning a round. When she made two assists on valorant, no kills, and won the round, she gained 32 experience points in the round. In another round she made 3 kills, 1 assist, but did not win- giving her a total of 46 experience points. In the final round, she won the game, made 3 assists, and 2 kills - giving her 65 experience points. How many experience points does one kill give her?

13. In the game Duck Life, you collect coins to buy steroids for your duck. One clump of steroid-infused duck feed is five coins, and each clump multiplies stamina by 1.5x. If you collect 25 coins, what is the ratio between your duck's stamina with the steroids vs without?

14. In Roblox Adopt Me, a scammer upcharges trades. For every trade you request from the scammer with a value of n, the scammer expects a value k back. In an equation, this is represented by $k = n^3 + 34$. If the scammer expects a trade value of 15,659, what trade value did you request?

15. Two players in a team run toward each other in Fortnite from opposite sides of a 35 degree hill. Going downhill is $\frac{1}{3}$ times faster than going uphill. Discovered previously, Angela's rate running downhill was 8 miles per hour and Bonnie's rate running downhill was 10 miles per hour. What is the ratio of miles that Angela runs to the miles that Bonnie runs if Angela runs uphill and Bonnie runs downhill in simplest form?