Sprint round (40 questions)

1) 483+158+117-28=?
   a) 730
2) A rectangle has an area of 28 and the length of one of its sides is 4. What is the perimeter?
   a) 22
3) How many positive perfect squares are there under 75?
   a) 8
4) Ralph has dogs and birds at his house. Each dog has 4 legs and each bird has 2 legs. If there are 23 heads and 50 legs in total, how many birds does Ralph have?
   a) 21
5) Bob starts peeling potatoes at 1:00pm and he can peel one potato every 3 minutes. How many potatoes will he be able to peel by 3:30pm?
   a) 50
6) Lucy has five $1 bills, two $5 bills, and one $10 bill. How many quarters is that worth in total?
   a) 100
7) 10+12+14+16+18+20 = ?
   a) 90
8) Kelly has had three tests this year and her scores are 85, 95, and 80. What score does she need to get on her fourth test to have an average score of 90?
   a) 100
9) Alex rolls a pair of dice. What is the probability that the values on the dice add up to 5?
   a) 1/9
10) How many two digit numbers are divisible by 7?
    a) 13
11) A train is traveling from city A to city B. The distance between the two cities is 220 miles, and the train travels at 50 mph. If the train leaves city A at 1:30, how far will the train be from city B at 4:00?
    a) 95
12) If x+1/x=15, what is x^2+1/x^2?
    a) 223
13) A regular polygon has exterior angles of 72 degrees. How many sides does this polygon have?
    a) 5
14) Bob is using the computer to surf the internet. He currently has 7 different tabs open, but realizes that his computer is running out of memory and he must close exactly 2 of the 7 tabs. How many ways can he do this?
    a) 21
15) On an internet poll asking whether pineapple pizza is morally acceptable, 1500 people voted yes while 2000 people voted no. How many more "yes" votes would it take to swing the ratio of yes to no votes to 7:8?

a) 250

16) It takes Lucas 3 minutes to read a single reddit comment and 10 minutes to write a response to a comment. How much time does it take for him to read through a list of 60 comments and respond to 35% of them?
    a) 390 minutes

17) Jankos has 84 minion-kills in a game of league of legends. At least how many more minions does he need to kill in that game to get his total minion-kills number to a prime number?
    a) 5

18) Consider a game played with two dice where two players take turns rolling dice, and whoever rolls doubles (two of the same number) first wins. What's the probability that in a single game the second player wins on his first roll?
    a) 5/36

19) Compute the final digit of 25^2021+36^2021
    a) 1

20) Joey has an average score of 90 across 5 tests. What is the lowest score Joey could've gotten on one of his tests, assuming tests are scored from 0-100?
    a) 50

21) If Amy flips 4 coins, what's the probability that all of them land on heads?
    a) 1/16

22) Katie is building a lego project. On day 1, she adds 2 bricks to the project; each day after that, she adds 2 more bricks than the previous day. On which day will the project have 182 bricks total?
    a) 13

23) Compute the remainder when 10^2021 is divided by 9.
    a) 1

24) Jacob and Esau, initially together, start running in different directions on a 400m circular track. If Jacob runs at 3 m/s and Esau runs at 5 m/s, after how many seconds will they be together again?
    a) 50

25) A bag of ¢5 coins and ¢7 coins has a total value of ¢43. How many ¢5 coins are in the bag?
    a) 3

26) At the start of the pandemic, Karen bought out all 600 rolls of toilet paper from Costco for $2 each. Now, she has to sell them at 75% of the original price, since she doesn't need them any more. Assuming she is able to sell everything, how much money did she lose in this entire ordeal?
    a) $300

27) Eve has 56 feet of fencing, and wants to make a rectangular pen for her cows. What is the largest possible area of this pen?
    a) 196

28) Alan played a prank on his brother Sam by removing every single key on his keyboard except for A, S, D, and F. How many unique 4 letter words can he type?
    a) 256

29) A 2x2x2 white cube is painted red on the outside. If it is then disassembled into 8 1x1x1 cubes, how many total exposed faces are white?
   a) 24

30) Jake's phone charges 2% per minute while plugged in, and drains 1% per minute when unplugged. He cannot use his phone when it's charging. If his phone is dead and he has an hour left until school starts, what is the maximum time he can spend using his phone?
   a) 40 minutes

31) Abby's sister is 5 years older than her and her mom is 30 years older than her sister. If Abby is 10 years old right now, how old will she be when her sister is ½ of her mom's age?
   a) 25

32) What is the smallest integer that satisfies these conditions: When I am divided by 2, the remainder is 0. When I am divided by 3, the remainder is 1. When I am divided by 5, the remainder is 2.
   a) 22

33) The retail price of a computer is $750. If the store is offering a 20% discount, how much is the new price of the computer in dollars?
   a) $600

34) Gavin and Matt are running around a 200 meter track. Gavin runs at a constant speed of 6 meters per second and Matt runs at a constant speed of 4 meters per second. If they both start running in the same direction at the same time, after how many seconds will Gavin and Matt meet once again?
   a) 100

35) Billy the farmer has a square piece of land that is 8 meters by 8 meters and he wants to buy fence posts to put around the perimeter of this land. If Billy wants to put fence posts exactly 2 meters away from each other, how many fence posts will he need?
   a) 16

36) What is the greatest prime number that is less than 50?
   a) 47

37) A soccer field is 100 yards long and 75 yards wide. If a player were to run from one corner to the opposite corner, how much distance would this player have run?
   a) 125

38) If you roll two standard six-sided dice, what is the chance that the sum of the dice add up to 7? Please express your answer in a simplified fraction.
   a) ⅙

39) A snail is stuck at the bottom of an 18 feet well. Every day, the snail is able to climb up 5 feet but in the night, it slides down 3 feet. After how many days will the snail finally reach the top of the well?
   a) 8 days

40) A local basketball league has 4 different teams. If each team plays each other twice, how many games are played?
   a) 12

Collected Answer Key:

| 730	22	8	21	50	100	90	100
1/9	13	95	223	5	21	125	390
5	5/36	1	50	1/16	13	1	50
3	300	196	256	24	40	25	22
600	100	16	47	125	1/6	8	12

Target round (8 questions)

1) What is the maximum possible product of two integers whose sum is 30?
   a) 225
2) The chess club has six members. For the next meet, the coach can take a team with only five members. In how many ways can the coach choose the team for the next meet?
   a) 6
3) If a#b=√(ab)+a+b, what is 8#18?
   a) 38
4) Timmy is trying to get to the school from his house. If his house is in the bottom left and the school is at the top right, and he can only move up or right while following grid lines, how many paths can he take to get to the school?


school

house
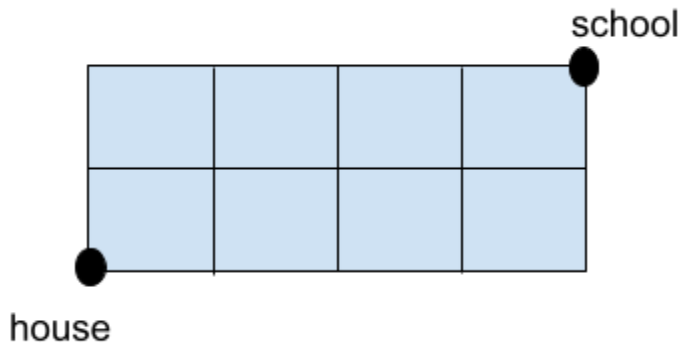
   a) 15

5) A square is inscribed in a circle, which is inscribed in another square, as shown below. If the side length of the larger square is 4, what is the area of the smaller square?

4
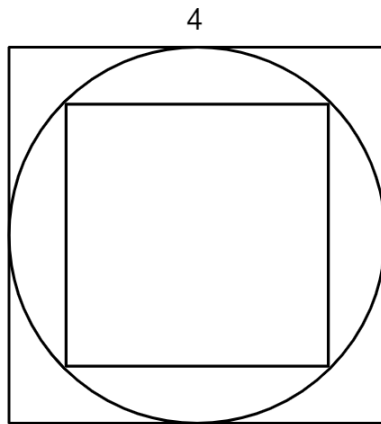
    a) 8

6) Elizabeth is trying to break into a safe, but it needs a numerical passcode in order to unlock, and the numpad only contains the numbers 1-9. Elizabeth knows that the keycode is at most 4 digits long, so she decides to try each possible passcode starting from smallest to largest (1, 2, 3,... 9997, 9998, 9999). If the passcode is 2021, how many numbers will she have inputted by the time the safe opens?

    a) 6977

7) A circle is inscribed within a square with side length 8. What is the area of the shaded section?

    a) $64-16\pi$
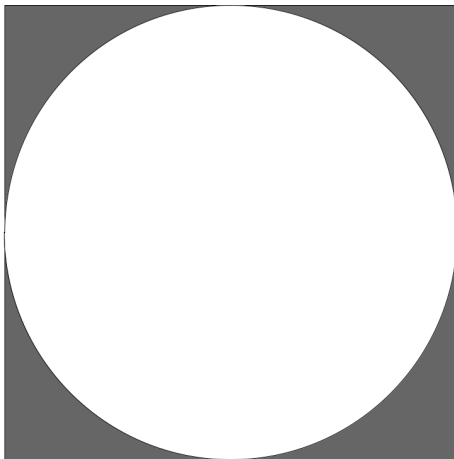
8) How many different arrangements of the word "GAUSS" can you make? Arrangements are not necessarily real words.

    a) 60

Collected Answer Key:

225	6	38	15
8	6977	$64-16\pi$	60