2021 Practice Competition 4 — Problems

Sprint 1 Raquel has collected $3.80 in nickels and dimes. She has exactly 48 nickels. How many dimes does she have?

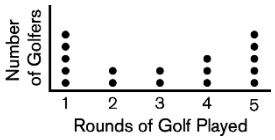
Sprint 2 At a certain middle school, there are 16 seventh graders and 24 eighth graders enrolled in algebra this term. What percent of the students enrolled in algebra are eighth graders?

Sprint 3 What positive integer is 56 less than its square?

Sprint 4 Each year, a certain tree doubled in height. At the end of 6 years, the height of the tree was 32 feet. What was the height of the tree at the end of 3 years?

Sprint 5 If a certain recipe requires 5 tablespoons of flour for every 2 ounces of butter, how many tablespoons of flour are needed if 2 pounds of butter are used? There are 16 ounces of butter in one pound.

Sprint 6 The number of rounds of golf played by each golfer of an amateur golf association is shown in the chart. What is the average number of rounds played by each golfer? Express your answer to the nearest whole number.



Sprint 7 A book company charges a shipping fee of $3 for the first item in a package, $2 for the second item and $1 for each additional item in the package. For example, the shipping fee charged for one package of four items is $3 + $2 + $1 + $1 = $7. How many dollars are saved by shipping 10 items in two packages of five items each, rather than five packages of two items each?

Sprint 8 Algebra exam scores for 27 students are given in the stem-and-leaf plot shown. What is the arithmetic mean of the median and mode of the given scores?

5	1 2
6	2 5 6 8 8 9
7	1 1 1 1 2 5 7 7 8 8 9
8	0 0 2 5 5 6
9	0 9

Sprint 9 One stamp is randomly selected from a 10-by-10 sheet of 100 stamps. What is the probability that the stamp selected is not along an outer edge? Express your answer as a common fraction.

Sprint 10 The WNBA champions have a twelve-player roster that includes two superstars. If a group of five starting players for this team must include the two superstars, how many different groups of five starting players are there?

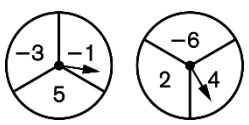
Sprint 11 Two pencils and one pen cost $0.80, and one pencil and two pens cost $1.15. How many cents would three pencils cost?

Sprint 12 There are 8 furlongs in a mile. There are 2 weeks in a fortnight. The British cavalry traveled 2800 furlongs in a fortnight. How many miles per day did the cavalry average?

Sprint 13 Two cubes have edge lengths of 6 inches and 12 inches. What is the ratio of the surface area of the smaller cube to the surface area of the larger cube? Express your answer as a common fraction.

Sprint 14 Phil Lanthropist won a great deal of money in a contest. He gave 20% of his winnings to his parents, 25% of the remaining money to his children, and the remaining $900,000 to his favorite charity. What was the total number of dollars that Phil won?

Sprint 15 Two circles with spinners at their centers are divided into three equal regions, as shown. When both spinners are spun, what is the probability that the product of the two values is negative? Express your answer as a common fraction.



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Sprint 16 Cheldelin Middle School has 12 doors to enter or leave the building. In how many ways is it possible to enter the building by one door and leave the building by a different door?

Sprint 17 Sue is four times as old as Tom is now, and she is 8/3 as old as Tom will be in 7 years. How many years old was Tom three years ago?

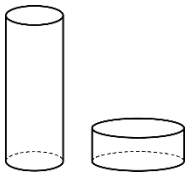
Sprint 18 By hitting a target, Juanita can score 16, 17, 23, 26, 29 or 40 points with each arrow she shoots. What is the fewest arrows she can shoot to score exactly 100 points?

Sprint 19 Twenty students bought tickets for a school party. All of the money received for these 20 tickets was used to purchase beverages. Then, an additional 10 students bought tickets. Rather than use this additional money to buy more refreshments, all 30 students received a $3.00 refund. How many dollars were used to buy beverages?

Sprint 20 A jar contains 10 red, 7 blue and 5 yellow marbles. What is the least number of blue marbles that must be added to the jar so that the probability of randomly selecting a blue marble is greater than 1/2?

Sprint 21 Terry is purchasing a bike that is on sale for 40% off the original price. After a coupon is applied that reduces the sale price by 20%, Terry's final cost for the bike is $168. What was the original price of the bike Terry is purchasing?

Sprint 22 Two cylindrical cans have the same volume. The height of one can is triple the height of the other. If the radius of the narrower can is 12 units, how many units are in the length of the radius of the wider can? Express your answer in simplist radical form.



Sprint 23 How many terms of the arithmetic sequence 88, 85, 82, … appear before the number –17 appears?

Sprint 24 In the chess club, there are 15 eighth graders, 6 of whom wear glasses. Nine students in the chess club wear glasses. Eight students in the chess club are neither eighth graders nor wear glasses. How many people are in the chess club?

Sprint 25 In a sequence, each term after the first is four more than three times the previous term. The fifth term of this sequence is 403. What is the first term?

Sprint 26 The average value of nine consecutive integers is 13. What is the sum of the smallest and largest of these integers?

Sprint 27 A 24-foot by 72-foot rectangular dance floor is completely tiled with 1-foot by 1-foot square tiles. Two opposite corners of the dance floor are connected by a diagonal. This diagonal passes through the interior of exactly how many tiles?

Sprint 28 Starting at the M and moving left, right, up or down to an adjoining letter, how many distinct paths can be followed to spell the word MATH?

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      H
    H T H
  H T A T H
H T A M A T H
  H T A T H
    H T H
      H
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Sprint 29 Given that $3^3 \times 9^3 \times 27^3 \times 81^3 = 9^x$, what is the value of x?

Sprint 30 Camy made a list of all distinct five-digit positive even integers whose five digits are 1, 3, 4, 5 and 9. What is the sum of the integers on Camy's list?

2021 Practice Competition 4 — Problems

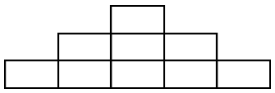
Target 1 Washington, D.C. has a land area of 68 square miles and a population of 720,000 people. What is the number of people per square mile in Washington, D.C.? Express your answer to the nearest hundred.

Target 2 What is the maximum number of consecutive positive integers that can be added together before the sum exceeds 400?

Target 3 Clifton left 280 acres of land to be divided among his sons Al and Bob in the ratio 4:3, respectively. How many acres should Al receive?

Target 4 George and Lea each toss a tetrahedral die with faces numbered 1 through 4, and then multiply the two resulting numbers. If the product is less than 9, George wins; otherwise, Lea wins. What is the probability that Lea will win? Express your answer as a common fraction.

Target 5 How many rectangles of any size are in the diagram?



Target 6 At the Word Store, each vowel sells for a different price, but all consonants are free. The word "triangle" sells for $6, "square" sells for $9, "pentagon" sells for $7, "cube" sells for $7 and "tetrahedron" sells for $8. What is the cost of the word "octahedron"?

Target 7 All six faces of a large wooden cube are painted blue, and then the cube is divided into smaller unit cubes. If 486 of the unit cubes have exactly one blue face, how many unit cubes make up the original large cube?

Target 8 Darla can complete a job in 8 hours, while Lonnie can complete the same job in 6 hours. Both Darla and Lonnie begin working on the job together. After working together for 3 hours, how much of the job is left to be completed? Express your answer as a common fraction.