

Max 12	Max 24	
Stage Tot	Score	Marker

Put ID Sticker Here

TARGET ROUND -- GRADE

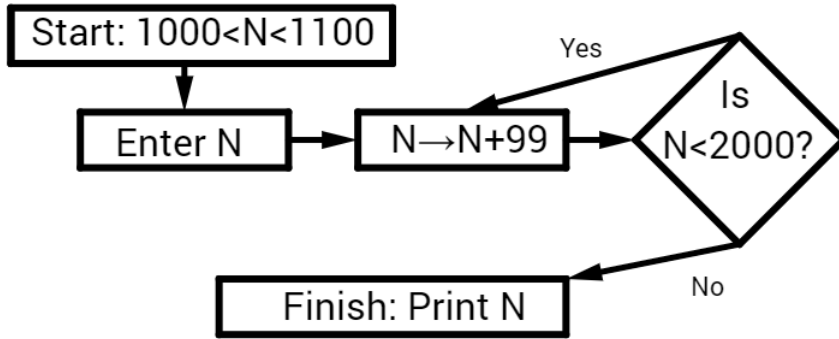


NO Peeking: Wait for instructions to start!

The region below is for the use of the markers

Max 4	Max 4	Max 4	Max 12	
Pr. 1-4	Pr. 5-8	Pr. 9-12	Stage Tot	Marker

1. At the start a whole number $1000 < N < 1100$ was entered in the flow chart below. The value of N was changed according to the instructions, and at the finish, the printed value was $N = 2023$.
 What was the value of N at the start?



_____ 1

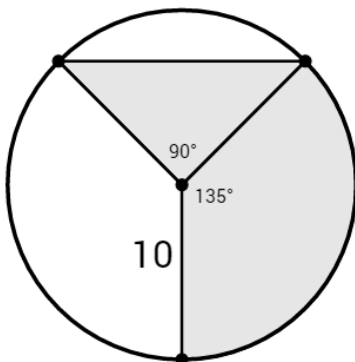
2. $\{1, 2, 3, 4, a, b, c\}$ is a set of 7 different numbers where 4 is the median value and all the 7 numbers are smaller than 60.
 What is the largest possible average value of the numbers of this set?
 Express your answer as a fraction in lowest terms.

_____ 2

3. There is a pile of 7 cards numbered $1, 2, 3, \dots, 7$ on the table. Gloria takes 3 different cards at random from the pile and writes down the sum of these 3 cards. What is the probability that the sum is a multiple of 3?
 Express the answer as a fraction in lowest terms.

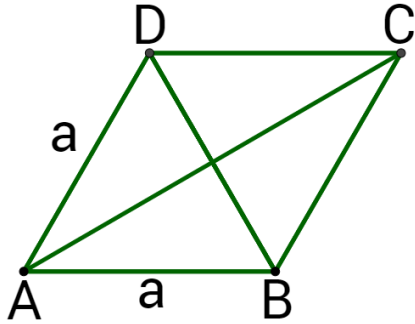
_____ 3

4. The shaded section of the circle of radius 10 consists of a right triangle and a sector of 135° . Find the area of the shaded section.
 Use $\pi = 3.14$, and round your answer to the nearest whole number.



_____ 4

5. Below is a rhombus with sides $a = 7$. Its short diagonal satisfies $BD = a = 7$. What is the square value of the long diagonal, (i.e. the value of AC^2) ?



_____ 5

6. N is a 6-digit number whose digits u, v, w, x, y, z , (not necessarily different), satisfy the condition $u + v + w + x + y + z = M^2$. If M is the largest such possible whole number, what is the smallest possible value of N ?

_____ 6

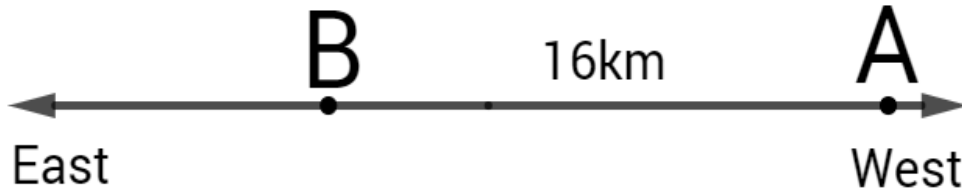
7. Two teams, A and B, compete in a basketball championship. The probability of Team A to win a game is **80%**, and the probability of Team B to win a game is **20%**, (no ties). The first team to win 3 games in total wins the championship. What is the probability that it will take only 3 games to decide the championship? Express the answer as a fraction in lowest terms.

_____ 7

8. What is the sum of all factors of **2023**? Note that **1** and **2023** are factors of **2023**. (**Hint**: 2023 is not a prime number).

_____ 8

9. Two cars, A and B , are 16km apart. Both cars are driven East on a very long road. If car A is moving with speed $92 \frac{\text{km}}{\text{h}}$ (kilometre per hour), and car B with speed $80 \frac{\text{km}}{\text{h}}$, (car A is located west of car B), in how many minutes will the two cars meet?



_____ 9

10. N is the smallest positive whole number such that all the following conditions are satisfied: $\{a, b, c, d, e, f\}$ is a set of 6 different primes, $N = a + b + c = d + e + f$, $a < b < c$, and $d < e < f$. What is the maximum possible value of $c - a$?

_____ 10

11. Jill drives a fuel-efficient car that consumes, on average, 6 litres of fuel per hour. When she started driving, the fuel tank was full. After driving T hours she stopped and added 10 litres of fuel so that the tank was 85% full. Then, she drove $\frac{T}{2}$ hours, stopped again, and filled the tank with 17 more litres of fuel so that the fuel tank was full again. How many liters of fuel can a full tank hold? Round your answer to the nearest whole number.

_____ 11

12. L , M , and N , are the values of the sides of a triangle, where $0 < L < M < N < 12$ are all whole numbers. The perimeter of the triangle is P . How many different values of P are there?

_____ 12