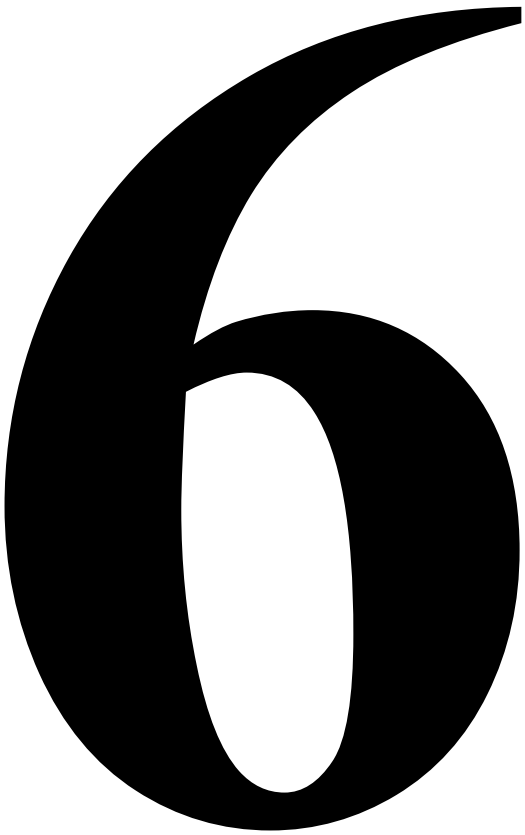
Max 12	Max 24	
Stage Tot	Score	Marker

Put ID Sticker Here

TARGET ROUND -- GRADE



NO Peeking: Wait for instructions to start!

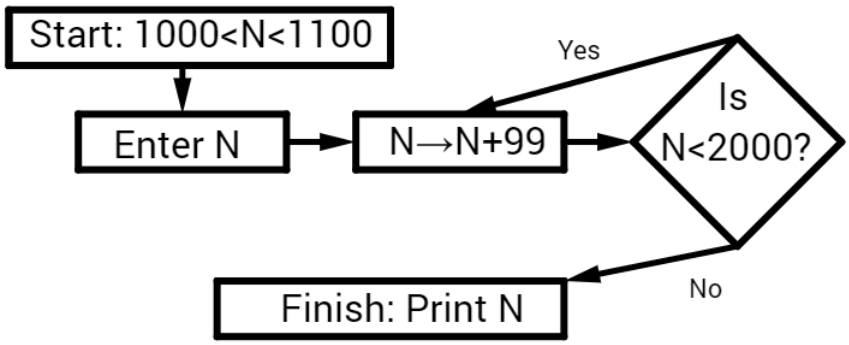
The region below is for the use of the markers

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

NAME: _____

SCHOOL: _____

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

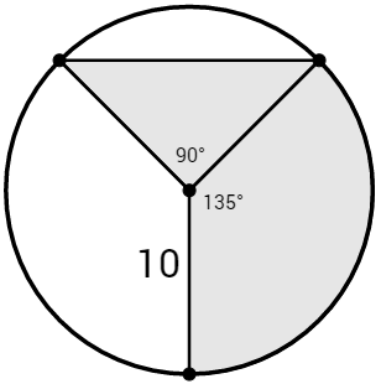
2. $\{1,2,3,4,a,b,c\}$ is a set of 7 different numbers where 4 is the median value and all the 7 numbers are smaller than 40.
What is the largest possible average value of the numbers of this set?
Express your answer as a fraction in lowest terms.

_____ 2

3. There is a pile of 7 cards numbered $1,2,3,\cdots,7$ 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 even?
Express the answer as a fraction in lowest terms.

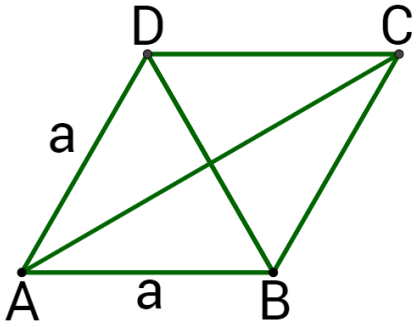
_____ 3

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 $a = 6$. Its short diagonal satisfies $BD = a = 6$. 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

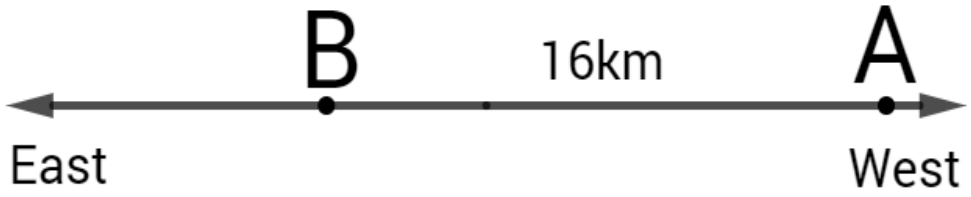
7. Two teams, A and B, compete in a basketball championship. The probability of Team A to win a game is 60%, and the probability of Team B to win a game is 40%, (no ties). The first team to win 3 games in total wins the championship. What is the probability that it will take only 3 games to decide the 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 $92\frac{km}{h}$ (kilometre per hour), and car B with speed $80\frac{km}{h}$, (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 minimum 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 $0 < L < M < N < 11$ are all whole numbers. The perimeter of the triangle is P. How many different values of P are there?

_____ 12