MESSAGE FROM ORBIT

```
--x.x...x...x.-x--.x.xx..-.x.-.x---x--xx---x.-.x-...x..x-x
5 4 4 7 4 7 4 6 5 8 8 4 1 8 1 8 5 6 5 3 5 6 1 8 2 7 4 8 6
```

From Wikipedia: "Sputnik 1 was the first artificial Earth satellite. The Soviet Union launched it into an elliptical low Earth orbit on 4 October 1957. It was a 58 cm (23 in) diameter polished metal sphere, with four external radio antennae to broadcast radio pulses. It was visible all around the Earth and its radio pulses were detectable. This surprise success... triggered the Space Race... The launch ushered in new political, military, technological, and scientific developments."

1 = _____ **4 =** _____ **7 =** _____

2 = _____ **5 =** _____ **8 =** _____

3 = _____ **6 =** _____ **9 =** _____

The following message has been received from orbit. American scientists are dashing to figure out the method of encoding. They need to know by 7:00 PM on the dot. Can you help them decipher it?

2 5 9 5 4 1 4 2 3 1 9 8 7 8 1 6 8

1 8 4 8 7 8 9 7 8 8 8 1 2 4 8 2 9 2

_ _ _ _ _ _ _ _

HIDDEN FIGURES

Katherine Johnson, one of the women whose work for NASA was portrayed in the 2016 film *Hidden Figures*, played a crucial role in calculating the trajectories for many manned missions.

According to Wikipedia, "When NASA used electronic computers for the first time to calculate John Glenn's orbit around Earth, officials called on Johnson to verify the computer's numbers; Glenn had asked for her specifically and had refused to fly unless Johnson verified the calculations." In one interview, Johnson said of that incident: "He knew that I was the only woman that worked on it. He said, if she comes up with the same answer that they have, then the computer's right. It took me a day and a half to compute what the computer had given them. Turned out to be the exact numbers that they had."

To honor her work, we present the "hidden figures" in these cryptarithms. Every digit in these division problems (https://en.wikipedia.org/wiki/Long_division) is represented by a letter, and the same letter represents the same digit everywhere it occurs.

Record the letter representing each digit in order from 0 to 9 to reveal a two-word phrase. Then use the letter-digit correspondences to calculate the value of the equation below. Expressing that value using the same letter-digit key will yield your final answer.

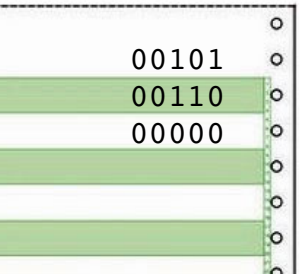
```
        ERUP
   ------------
MY | OUTPUT
   -OCE
    ---
     ORP
     -OUR
      ---
      CUU
      -CMU
       ---
       CBT
       -CBP
        ---
          C
```

```
                C
          ----------
CORRECT | MERCURY
          -MTRRUPM
           --------
             ROBOT
```

C

0 1 2 3 4 5 6 7 8 9

(51 x CUBE) + (17 x ROOT) - YUM =



Puzzled Pint
July 2019

UNMANNED

The Apollo 4 mission, conducted on November 9, 1967, was the first unmanned test flight of the Saturn V launch vehicle.

Construct a gantry from the words below and examine it to discover the part of the Saturn V that would be manned in future missions.

MANET
MANTA
ROMAN

ADAMANT
ALMANAC
EMANATE

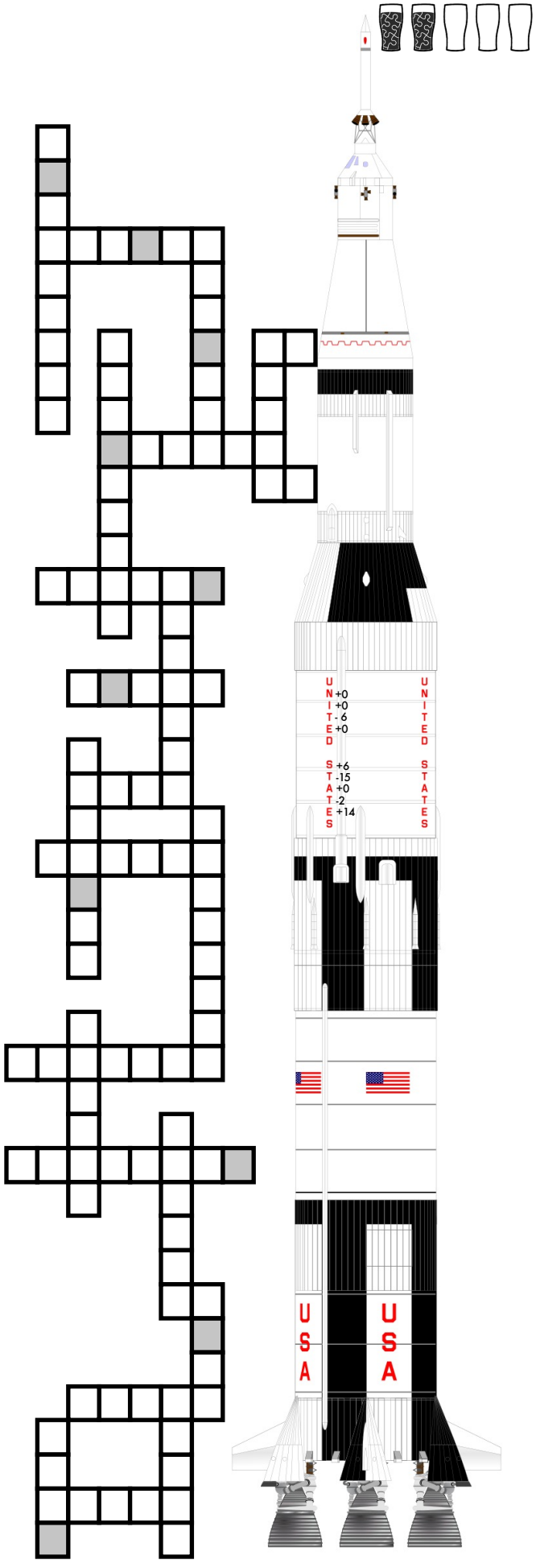
GOURMAND
MANEUVER
MANIFEST
ROMANTIC
TALISMAN

DISMANTLE
GERMANIUM
MANDATORY
MANGANESE
PERMANENT
PYROMANIA

BLANCMANGE
MANAGEMENT
MANUSCRIPT
SALAMANDER

PERFORMANCE
PORTMANTEAU

EMANCIPATION
ROOM AND BOARD



SMALL STEPS

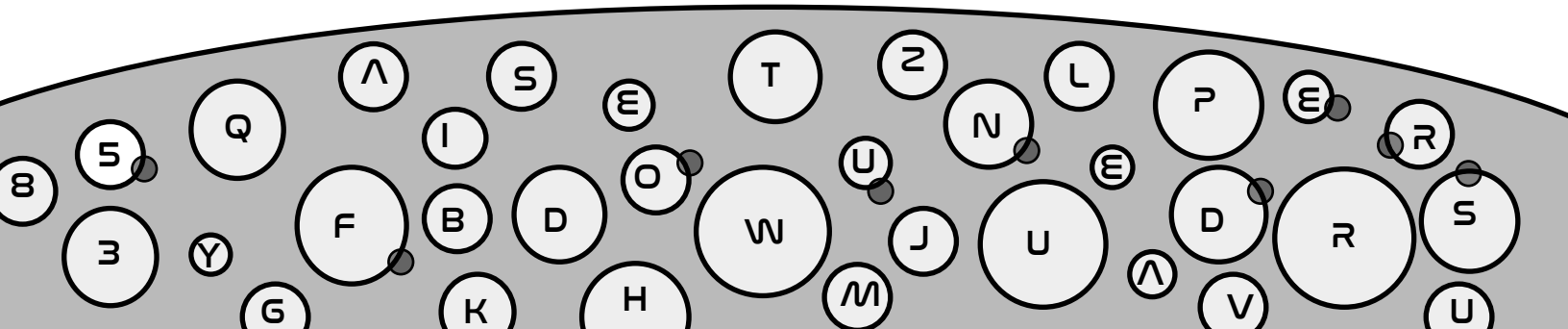
In July 1969 – 50 years ago this month – Apollo 11 landed on the moon. After descending from the Lunar Excursion Module to the lunar surface, Neil Armstrong spoke the historic words, "That's one small step for [a] man, one giant leap for mankind."

Tonight you too will be turning a SMALL STEP into a GIANT LEAP. Change one letter at each step of your descent (never the same position twice in a row).

	SMALL	STEP
	_□___	
Jack and the bean____	__□__	____ To ooze or leak
	____□	
	_____	_□__
Move in a sinuous, provocative manner	□____	
	_□___	____ Pilsner, lager or stout
Fill in the _____	__□__	
	____□	____
Mark with a hot iron	____□	
	_____	_□__ Father of Regan, Cordelia &
	_□___	Goneril
	GIANT	LEAP

How does an astronaut get to the surface of the moon?

_____ ______



META: LAUNCH WINDOWS

And so our review of the Space Age arrives at the present day, in which SpaceX is hard at work on developing reusable launch systems.

Each of your four answers represents a reusable rocket. Three series of launches have been scheduled for this group of rockets. During each group of launches, each rocket is launched at the time of day indicated, and travels upward at the rate of one square per minute. There is also an aerial drone, already airborne, which begins traveling eastward at the indicated time at the rate of one square per minute. At the moment that the drone and the rocket occupy the same volume of space (don't worry, they don't actually crash into each other, as much as they might appear to do so!), the drone will "gather telemetry" about the rocket and transmit that info.

When each rocket has been launched three times and all the telemetry has been analyzed, you will have created a....