The following graphs were created using the updated Citi bike dataset provided by Citi (see attached PNG file). You have been hired by Citi to determine if they are any prevailing patterns in their weekly ridership. Ideally, Citi would like to be able to predict when the heaviest periods of traffic will occur throughout the week, so they could place additional bikes at frequently used stations. Using the two given graphs, enter the number of the below option that describes what patterns you would share with management and how you would advise management to act:

- 1 - There seems to be no discernible pattern in ridership; Citi should continue to allocate its resources in the same way
- 2 - There seems to be a largely bimodal pattern in ridership throughout the day; however there seems to be no discernible pattern based on the day. Citi should allocate more bikes at popular stations around 8AM and 5PM
- 3 - There seems to be a largely bimodal pattern in ridership throughout the day; however, this pattern is largely dependent on the day of the week. Citi should allocate more bikes at popular stations around 8AM and 5PM on weekends, and they should allocate more bikes at popular stations around 12PM on weekdays
- 4 - There seems to be a largely bimodal pattern in ridership throughout the day; however, this pattern is largely dependent on the day of the week. Citi should allocate more bikes at popular stations around 8AM and 5PM on weekdays, and they should allocate more bikes at popular stations around 12PM on weekends
- 5 - None of the above

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NEXT

There are 4 red balls, 4 green balls and 3 blue balls in a box. How many ways can 3 balls be drawn from the box such that at least 1 of these 3 balls is colored blue? Assume that all balls (even those of the same color) are distinct from each other.

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A box contains three types of molecules: 96 of type A, 152 of type B, and 141 of type C. Every minute, either two molecules of different types collide and morph into two molecules of the third type, or three molecules of different types collide and magically disappear. What is the LEAST number of molecules that could exist in the box at any point in time?

A. ◯ 0

B. ◯ 1

C. ◯ 2

D. ◯ 4

E. ◯ 8

You are given two ropes and a lighter. The time required to burn through rope 1 with a single flame is 40 minutes, while the time required to burn through rope 2 with a single flame is 60 minutes. The burn rates in different sections of the ropes are unknown and vary. Which of the following amounts of time (in minutes) is NOT possible to measure using the two ropes and the lighter?

A. ◯ 20

B. ◯ 25

C. ◯ 30

D. ◯ 35

E. ◯ 50

Given any undergraduate student, there is a 10% chance that they will join a graduate program. In an undergraduate class of 400 students, which of the following is CLOSEST to the probability that at least 50 of the students will be joining a graduate program?

A. ◯ 5%

B. ◯ 10%

C. ◯ 15%

D. ◯ 20%

E. ◯ 25%

Among the programmers in a software company, two-fifths know Java and one-quarter know both Java and C++. What fraction of those in the company of who know Java also know C++?

A. ◯ 1/4

B. ◯ 3 / 8

C. ◯ 5 / 8

D. ◯ 3 / 4

E. ◯ 4 / 5

A set of data points (x, y) in the 2-D Cartesian plane is generated by a Gaussian distribution centered at the origin with covariance matrix $\begin{bmatrix} 1 & -1/2 \\ -1/2 & 1 \end{bmatrix}$. Which point among the following is MOST likely to be identified as an anomaly?

A. ◯ (1, 0)

B. ◯ (1, -1)

C. ◯ (-1, -1)

D. ◯ (0, 1)

E. ◯ There is not enough information to answer this question

You are given two plots (see attached image file). The first is a scatterplot of `highway mileage` against `vehicle displacement`, color-coded by `vehicle class` (7 total, ordered from smallest vehicle to largest, with 2-seaters being the smallest and SUVs being the largest). The second is a box plot of `highway mileage` against `vehicle class`.

Which of the following statements appear to be true from these two plots? Enter the number of the below option which corresponds to the correct combination of statements I - III:
  - I. Within any individual vehicle class, vehicles with smaller engine displacement generally run for higher mileage
  - II. Smaller vehicle classes generally run for higher mileage
  - III. Given two vehicles with similar engine displacement, the smaller one will generally run for higher mileage
  - 1 = None of I - III
  - 2 = I only
  - 3 = II only
  - 4 = I and II only
  - 5 = I, II, and III

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You are shown a set of four cards placed on a table, each of which has a number on one side and a colored patch on the other side. The visible faces of the cards show 3, 8, red and brown. Which card(s) must you turn over in order to test the truth of the proposition that if a card shows an even number on one face, then its opposite face is red?
  - I. 3
  - II. 8
  - III. Red
  - IV. Brown

A. ◯   I and II

B. ◯   I and III

C. ◯   II and III

D. ◯   II and IV

!1566274692579

Imagine you are an analyst at an investment firm. Your manager believes that any day Apple announces a new product, the share price of Apple stock increases significantly. You need to determine whether this hypothesis is true or false. However, Apple is expected to announce a new product tomorrow, so you have limited time to research.
Which two of the following choices would you investigate to assess the validity of this hypothesis?:
  - I. Stock price fluctuations on days Apple made a new product announcement
  - II. Stock price fluctuations on days Apple did not make a new product announcement
  - III. Corporate announcements on days when Apple's share price increased significantly
  - IV. Corporate announcements on days when Apple's share price did not increase significantly

A. ◯   I and II

B. ●   I and III

C. ◯   II and III

D. ◯   I and IV

E. ◯   II and IV

The game of Monopoly is played on a square board, with 10 spaces per side (so 40 total). A player starts at the space marked "Go" (the 1st square), and on each turn rolls two six-sided dice, advancing forward a number of spaces equal to the sum of the two numbers that land face-up. (If a player rolls a sum that would normally cause them to advance past the 40th square, they will instead "loop around" the board; i.e. if a player would have landed on a hypothetical 44th square, they will instead go to the 4th square on the board.) Let p be the probability that a player, after they "loop around" the board ten times, lands on the space "Boardwalk" (the 40th square) before they "loop around" the board an eleventh time. Which integer is CLOSEST to the value of $20p$?

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