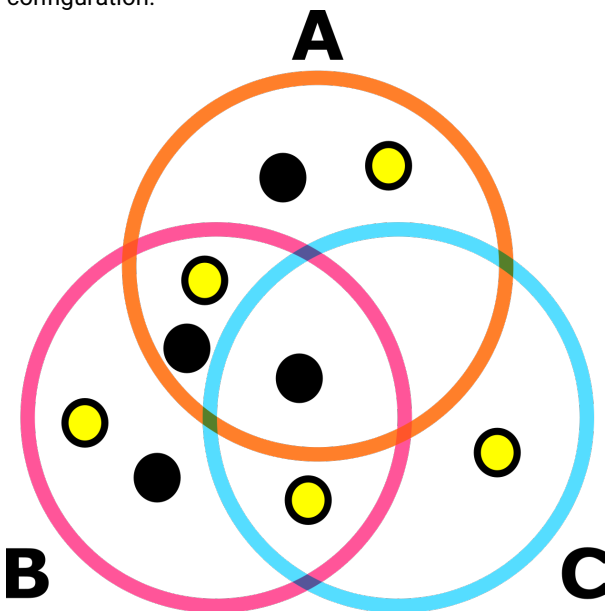


1. Adam is a rabbit breeder. In the beginning he had 50 white rabbits and 50 black rabbits. It is known that among the babies of white rabbits, 25% are white and 75% are black. Meanwhile, among the babies of black rabbit, 75% white and 25% are black. **If Adam's rabbits have 100 babies, how many black baby rabbits does Adam have?**
- A) 100
 B) 75
 C) 50
 D) 25
 (Correct +3, Wrong 0, Blank 0)

2. Andy, Ben, and Charlie are playing marbles. They drew three overlapping circles A, B, and C and threw their marbles randomly such that the marbles are in the following configuration.



- What percentage of black marbles are inside exactly two circles compared to all black marbles?**
- A) 50%
 B) 40%
 C) 20%
 D) 25%
 (Correct +3, Wrong 0, Blank 0)

3. **If an integer that divides 2022 is chosen at random, what is the probability that it is a prime number?**
- A) $\frac{3}{16}$
 B) $\frac{3}{8}$
 C) $\frac{3}{4}$
 D) $\frac{1}{3}$
 (Correct +3, Wrong 0, Blank 0)

4. Consider the pattern of numbers: 1, 4, 5, 9, 14, 23, 37, and so on. In this pattern, the sum of two neighboring numbers become the next number. Now let's make another pattern by taking the difference between every pair of neighboring numbers in the pattern above: 3, 1, 4, 5, and so on. Let's say the 99'th number in the first pattern is x , and the 100'th number in the first pattern is y . **What is $x - y$?**
- A) 100
 B) 0
 C) 1
 D) 99
 (Correct +3, Wrong 0, Blank 0)

5. Andy, Ben, and Charles are playing a card game using the cards below. Each player is given three cards with different colors at random. Then, the player calculates the sum of the numbers in their cards. The winner is the one with the greatest sum.

It's known that Andy got card 1, Ben got card 6, and Charlie got card 9. **What is the probability that Andy wins the game?**



- A) $\frac{1}{4}$
 B) 0
 C) $\frac{1}{2}$
 D) $\frac{3}{4}$

(Correct +3, Wrong 0, Blank 0)

7. When two unfair coins are tossed, the probability that they show two Heads is $\frac{1}{6}$ and the probability that they

show two Tails is $\frac{1}{4}$.

What is the probability they show at least one Head?

- A) $\frac{7}{12}$
 B) $\frac{1}{4}$
 C) $\frac{3}{4}$
 D) $\frac{5}{12}$

(Correct +3, Wrong 0, Blank 0)

8. When an integer is divided by 2, it leaves a remainder of 1. When divided by 3, it leaves a remainder of 2.

When that integer is divided by 6, it leaves a remainder of

_____.

- A) 3
 B) 5
 C) 2
 D) 1

(Correct +3, Wrong 0, Blank 0)

6. Consider the following financial report.

Komodo Company Income Statement

September, 2021

Net sales	5,800,000
Cost of sales	2,550,000
Gross profit	<u>3,250,000</u>
Operating Expenses	600,000
Operating Income	<u>2,650,000</u>
Gain (Loss)	(900,000)
Other Income	250,000
Income before taxes	<u>2,000,000</u>
Tax expenses	500,000
Net Income	<u><u>1,500,000</u></u>

According to the above report. Which of the followings is the correct way to calculate the "Operating Income"?

- A) "Income before taxes" - "Cost of sales" + "Operating Expenses"
 B) "Net sales" - "Cost of sales" + "Operating Expenses"
 C) "Income before taxes" - "Cost of sales" + "Operating Expenses"

D) "Net sales" - "Cost of sales" - "Operating Expenses"
(Correct +3, Wrong 0, Blank 0)

9. Three kids: Andy, Bruce, and Clara, play a tournament of tennis. It is known that Andy won twice and Bruce won once. No draw is allowed.

How many time(s) did Clara win?

(note: in a tournament, every participant plays exactly once against every other participant)

- A) 2
- B) 1
- C) 0
- D) 3

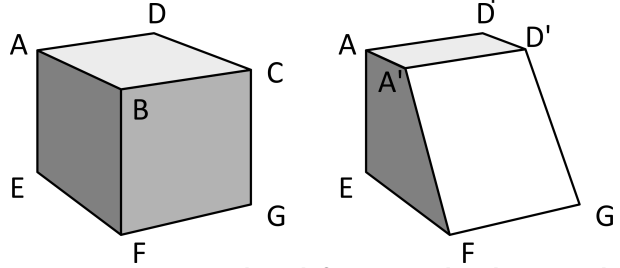
(Correct +3, Wrong 0, Blank 0)

10. When two fair dice are rolled, what is the probability of getting a sum of 11?

- A) $\frac{1}{15}$
- B) $\frac{1}{18}$
- C) $\frac{1}{12}$
- D) $\frac{1}{6}$

(Correct +3, Wrong 0, Blank 0)

11. A cake in the shape of a cube ABCD.EFGH is cut. The cut starts from the line exactly halfway between AD and BC, straight to the line FG as shown. So line A'D' was exactly in the middle line AD and BC. After that the smaller part is eaten.



How many percent cake is left compared to the original cake?

- A) 25%
- B) 50%
- C) 75%
- D) 60%

(Correct +3, Wrong 0, Blank 0)

12. A wire in a shape of a circle is cut into three parts, each of the same length. The three parts is then bent to make three new circles.

What is the ratio between the total area of the three new circles compared to the initial one?

- A) 1 : 9
- B) 1 : 6
- C) 1 : 2
- D) 1 : 3

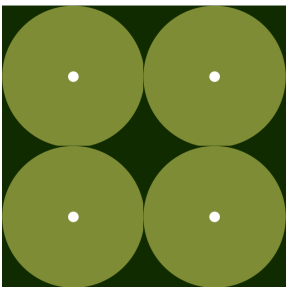
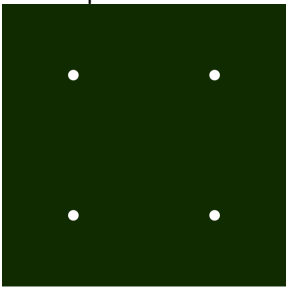
(Correct +3, Wrong 0, Blank 0)

13. Which of the following formulas is different than the other ones?

- A) $V = \frac{(\pi r)^2 h}{3\pi}$
- B) $V = \frac{1}{3}\pi r^2 h$
- C) $V = \frac{(\pi r)^2 h}{3r}$
- D) $V = \frac{\pi r^2 h}{3}$

(Correct +3, Wrong 0, Blank 0)

14. A neighborhood park has width of 20 meters and length of 20 meters. Four lamps are installed in specific places as shown in the first picture. However the four lamps can only light its surrounding area up to 5 meters away as shown in the second picture.

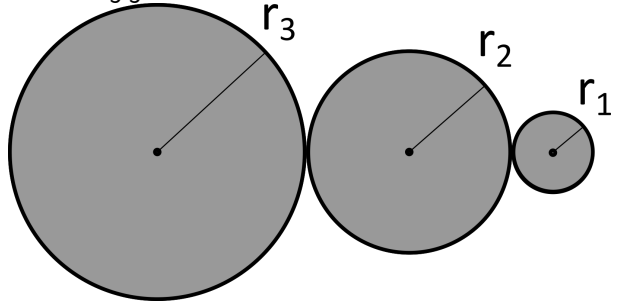


Find the area of the dark four-pointed star right in the middle of the park. You can use $\pi = 3.14$

- A) $5.38 m^2$
- B) $10.75 m^2$
- C) $43 m^2$
- D) $21.5 m^2$

(Correct +3, Wrong 0, Blank 0)

15. Two gears in contact rotate in such a way that speed of rotation ω times the radius of the gear r is the same for both gears. In other words: $\omega \cdot r$ is the same for the two contacting gear.



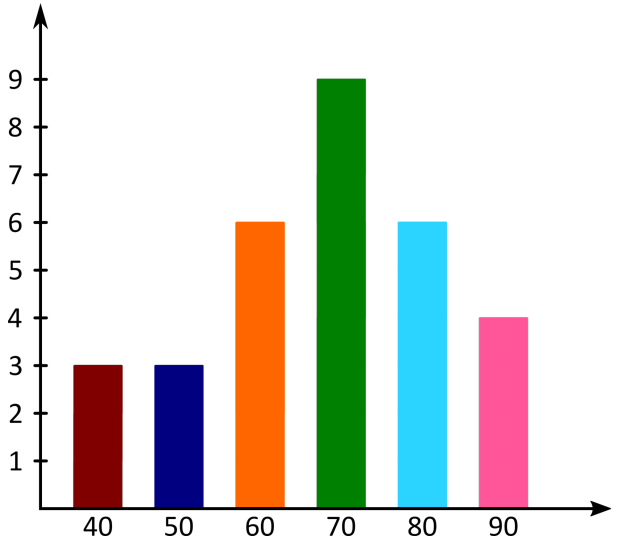
Consider the combination of gear above. It's known that if the smallest gear rotates twenty times a minute, the medium one rotates 5 times a minute, and the biggest one rotates 4 times a minute

Which of the following shows the correct ratio between the gears' radii?

- A) $r_1 : r_2 : r_3 = 4 : 5 : 20$
- B) $r_1 : r_2 : r_3 = 2 : 5 : 6$
- C) $r_1 : r_2 : r_3 = 1 : 2 : 3$
- D) $r_1 : r_2 : r_3 = 1 : 4 : 5$

(Correct +3, Wrong 0, Blank 0)

16. Below is the chart of a maths exam result. But there is a mistake in the chart, one student got 30 marks lower than he should.



What is the average mark of the classroom once the mistake has been fixed?

- A) 80
- B) 71
- C) 81
- D) 70

(Correct +3, Wrong 0, Blank 0)

17. The average of the numbers $1, 5, 2, x, 3, x, 4, 5, x$ is equal to the average of the numbers $2, y, y, 1, 3, 4$.

Find $x - y$.

- A) 1
 B) $\frac{4}{3}$
 C) $-\frac{2}{3}$
 D) $-\frac{5}{3}$

(Correct +3, Wrong 0, Blank 0)

18. The average of three numbers is 99.
 If one of them is increased by 9, the average will increase by _____.

- A) 11
 B) 3
 C) 1
 D) 9

(Correct +3, Wrong 0, Blank 0)

19. A coin is not fair: when it is tossed, the probability of getting a Head is twice the probability of getting a Tail.

If that coin is tossed three times, what is the probability of getting two Heads and one Tail?

- A) $\frac{4}{27}$
 B) $\frac{8}{27}$
 C) $\frac{4}{9}$
 D) $\frac{2}{3}$

(Correct +3, Wrong 0, Blank 0)

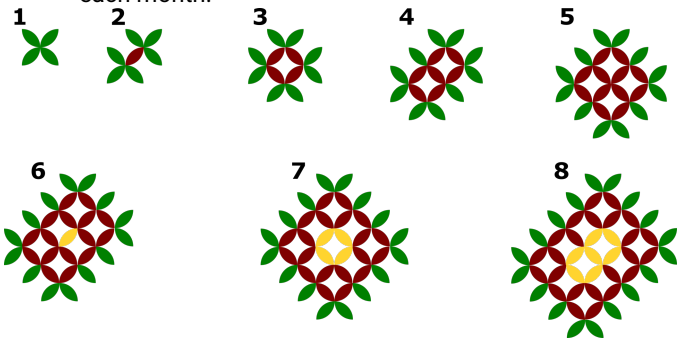
20. Blindfolded, Andy has to choose one ball from six balls that are numbered with six consecutive integers, but Andy doesn't know the actual numbers.

What is the probability that Andy picks an odd-numbered ball?

- A) $\frac{1}{3}$
 B) $\frac{1}{4}$
 C) $\frac{1}{2}$
 D) $\frac{1}{6}$

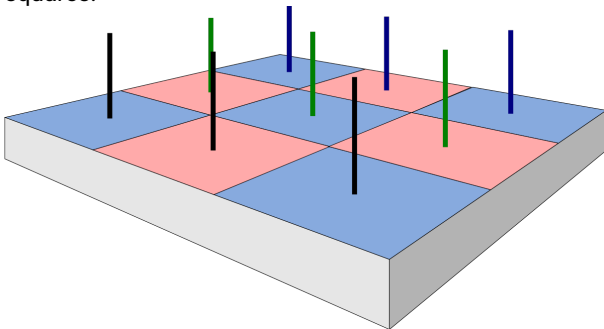
(Correct +3, Wrong 0, Blank 0)

21. The following shows a growth of a plant at the end of each month.

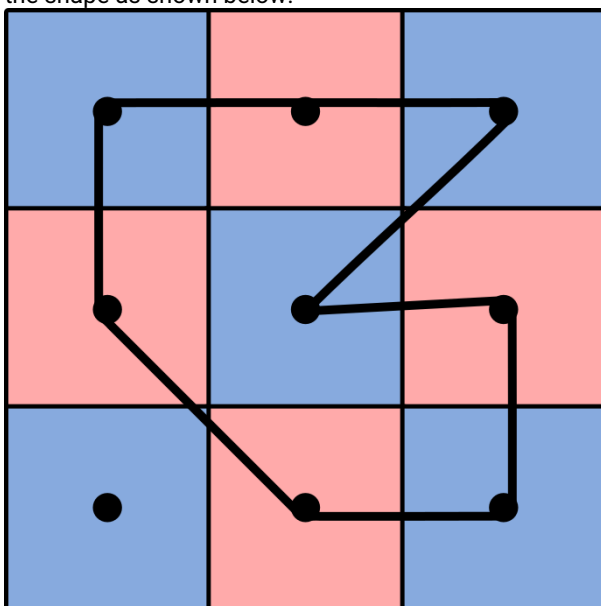


How many leaves does the plant have at the end of its first year? (Write your answer only in numbers.)
(Correct +4, Wrong 0, Blank 0)

22. A checkerboard consists of 3 x 3 unit squares. Nine pegs are fixed on the board, each in the center of all the squares.



A rubber band is inserted into the pegs in such a way to form the shape as shown below.

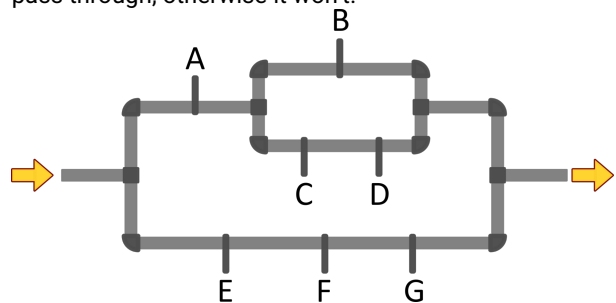


What is the area encircled by the rubber band in unit square? (Write your answer only in numbers.)
(Correct +4, Wrong 0, Blank 0)

23. If
$$\frac{1}{1 + \frac{1}{x}} = \frac{x}{2}$$

then $x = \underline{\hspace{2cm}}$. (Write your answer only in numbers.)
(Correct +4, Wrong 0, Blank 0)

24. The following shows a configuration of pipes. Water current enters from the left and exits to the right. In the system there are seven valve, A, B, C, D, E, F, and G. These valves can be closed and opened. If a valve is open it let water pass through, otherwise it won't.



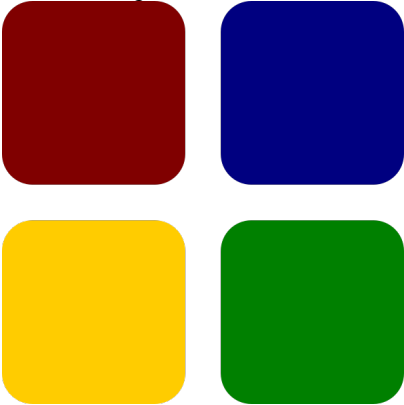
What is the minimum numbers of valves need to be left open to let the water pass through from left to right? (Write your answer only in numbers.)
(Correct +4, Wrong 0, Blank 0)

25. If a number is added by 3, we get a new number. If the new number is multiplied by 3, we get yet another new number. If the latest number is divided by 6, we get the original number.

What is the original number? (Write your answer only in numbers.)

(Correct +4, Wrong 0, Blank 0)

26. Four numbers are going to be written on 4 cards arranged as shown.



It is known that the sum of the numbers on the two top cards is 8, the sum on the two bottom cards is 7, and the sum on the two left cards is 6.

What is the sum of the numbers on the two right cards? (Write your answer only in numbers.)

(Correct +4, Wrong 0, Blank 0)

27. Harry uses four single-digit numbers pincode for his phone. The average of all the digits is 5.

What is the sum of all the digits? (Write your answer only in numbers.)

(Correct +4, Wrong 0, Blank 0)

28. Andy has two numbers and Bruce has three numbers. The average of Andy's numbers is equal to the average of Bruce's numbers. Bruce gives one of his numbers to Andy, then Andy's average and Bruce's average each becomes equal to 42.

What is the number that Bruce gave to Andy? (Write your answer only in numbers.)
(Correct +4, Wrong 0, Blank 0)

29. Given that $1, x, y, 2023$ is an arithmetic sequence.
What is $x + y$? (Write your answer only in numbers.)
(Correct +4, Wrong 0, Blank 0)

30. Given the addition of two 3-digit numbers to make twice of a 3-digit number: $\overline{abc} + \overline{bca} = 2 \times \overline{cab}$.

How many possible values are there for $\frac{3a + 4b}{7c}$? (Write your answer only in numbers.)
(Correct +4, Wrong 0, Blank 0)

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Answer Keys

No Key	Code
1 C	KMF/2013/PDSTE
2 D	KMF/1996/GBAH7
3 A	KMF/2037/HRH1Z
4 B	KMF/2043/JCYHH
5 B	KMF/1954/3DKUP
6 D	KMF/1983/GTVEZ
7 C	KMF/1934/UU9QG
8 B	KMF/2039/CVMYF
9 C	KMF/2041/IKFGW
10 B	KMF/2049/97TLA
11 C	KMF/1957/FHQVE
12 D	KMF/2024/QZHLG
13 C	KMF/1980/PSTOW
14 D	KMF/1988/AUPUU
15 D	KMF/2016/6HWWX
16 B	KMF/2021/D8HGQ
17 D	KMF/1953/FW2TB
18 B	KMF/1938/D62TG
19 C	KMF/2044/TP2CC
20 C	KMF/1951/MSUVR