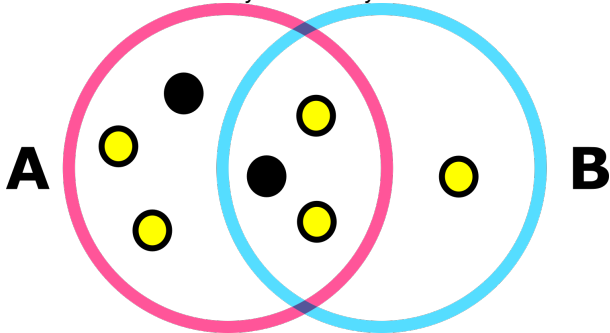


1. Andy and Ben are playing marbles. They made two overlapping circles called A and B and throws their marbles randomly and get the configuration as shown. The black Marbles are Andy's and the yellow ones is Ben's.



What percentage of Ben's marbles that end up in circle A or circle B, but not on both circle?

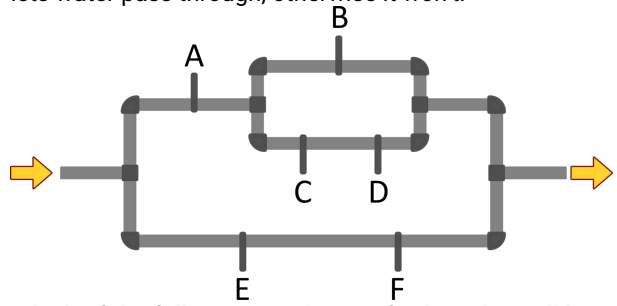
- A) 60%
 - B) 20%
 - C) 40%
 - D) 80%
- (Correct +3, Wrong 0, Blank 0)

2. Which of the following expression are mathematically different from the other one?

1. Eric has two sets of legos, one set contains 3 pieces, the other contains 8 pieces.
2. Eric has three sets of legos, one set contains 3 pieces, and the other two each contains 4 pieces.
3. Eric has four identic sets of legos, each set has two bags, the first bag contains 3 pieces the second bag contains 2 pieces.
4. Eric has two sets of legos the first one contains 3 pieces and the second one consists of two bags, each bag contains 4 pieces.

- A) 4
 - B) 3
 - C) 2
 - D) 1
- (Correct +3, Wrong 0, Blank 0)

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



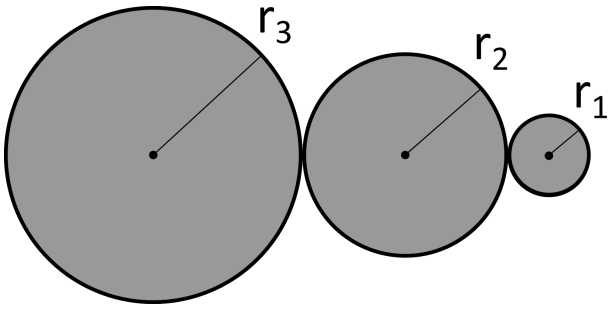
Which of the following condition of valves that will let water pass through the sytem?

- A) Open: A, C, E
Closed: B, D, F
 - B) Open: A, B, E, F
Closed: C, D
 - C) Open: B, C, D, E
Closed: A, F
 - D) Open: A, C, F
closed: B, D, E
- (Correct +3, Wrong 0, Blank 0)

4. $1 + 2^{n+1} + 4^n = \underline{\hspace{2cm}}$.

- A) $(2^n)^2 + 1$
 - B) $(2^n - 1)^2 + 2$
 - C) $(2^n)^2$
 - D) $(2^n + 1)^2$
- (Correct +3, Wrong 0, Blank 0)

5. Two gears in contact they rotate in such a way that their 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.



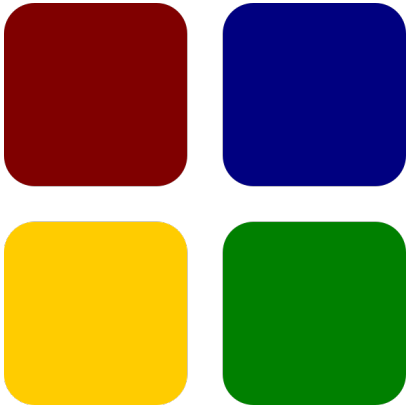
Consider the combination of gear above with ratio of $r_1 : r_2 : r_3 = 1 : 4 : 5$.

If the smallest gear rotates fifteen times a minute, how many rotation does the biggest gear make in a minute?

- A) 1
B) 8
C) 5
D) 3

(Correct +3, Wrong 0, Blank 0)

6. Four cards are arranged into 2 by 2 table as shown. On each card is written a certain number.



The sum of the numbers on the two top cards is 8. The sum of the numbers on the two bottom cards is 7. And the sum of the numbers on the two left cards is 6.

If the number on the top left card is 3, what is the number on the bottom right card?

(Correct +4, Wrong 0, Blank 0)

7. $(2^{x-2})^{x+2} = \underline{\hspace{2cm}}$.

- A) $\frac{4^x}{16}$
B) 2^{2x}
C) $\frac{2^{x^2}}{16}$
D) 2^{x^2}

(Correct +3, Wrong 0, Blank 0)

8. 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.

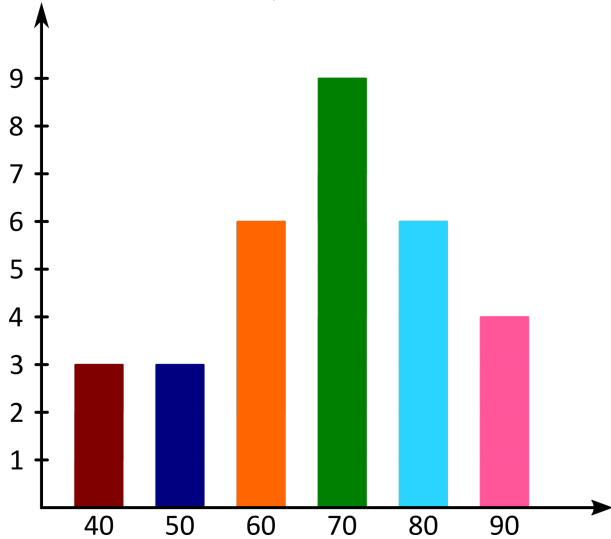
How many time(s) did Clara win?

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

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

(Correct +3, Wrong 0, Blank 0)

9. Below is the chart of the maths exam results. But there is a mistake in the chart. The teacher unintentionally put a score of 40 for a student, instead of 70.



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

(Correct +4, Wrong 0, Blank 0)

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

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

(Correct +3, Wrong 0, Blank 0)

11. 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. What is the ratio of "Tax expenses" compared to the "Income before taxes" in percent?

- A) 75%
- B) 15%
- C) 20%
- D) 25%

(Correct +3, Wrong 0, Blank 0)

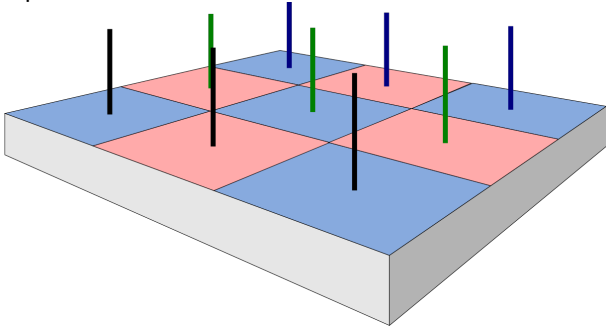
12. When an integer is divided by 2, it leaves a remainder of 1. When divided by 3, it leaves a remainder of 2.

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

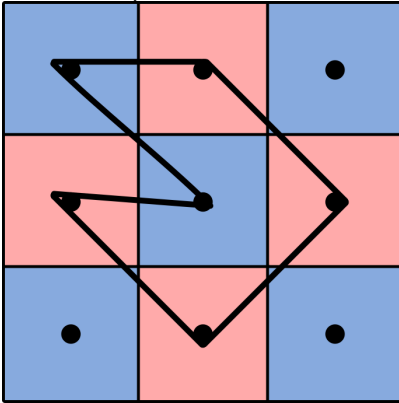
- A) 3
- B) 5
- C) 2
- D) 1

(Correct +3, Wrong 0, Blank 0)

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



Then 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)

14. A wire in a shape of a circle is cut in half into two equal parts. The two parts is then bent to make two new circles.
What is the ratio between the total area of the two new circles compared to the initial one?

- A) 1 : 8
B) 1 : 6
C) 1 : 2
D) 1 : 4
(Correct +3, Wrong 0, Blank 0)

15. If $x(y + z) = yz$ then $\frac{1}{y} + \frac{1}{z} = \dots$

- A) $\frac{x}{yz}$
B) $\frac{1}{x}$
C) $\frac{x}{yz}$
D) $\frac{1}{yz}$

(Correct +3, Wrong 0, Blank 0)

16. Adam is a rabbit breeder. And he has 50 white rabbits and 100 black rabbits. It is known that half of the white rabbits are male and half are female, meanwhile, a quarter of black rabbits are male and three quarters are female?
What is the comparison between the numbers of male and female rabbits?

- A) 3 : 5
B) 5 : 7
C) 1 : 2
D) 3 : 4
(Correct +3, Wrong 0, Blank 0)

17. 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) $\frac{5}{12}$
 D) $\frac{3}{4}$

(Correct +3, Wrong 0, Blank 0)

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

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

(Correct +3, Wrong 0, Blank 0)

19. Given three positive numbers with median = mean = x . After the median is erased, we calculate the new average, y .

What is $\frac{x}{y}$?

- A) 1
 B) 4
 C) 2
 D) 3

(Correct +3, Wrong 0, Blank 0)

20. 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.

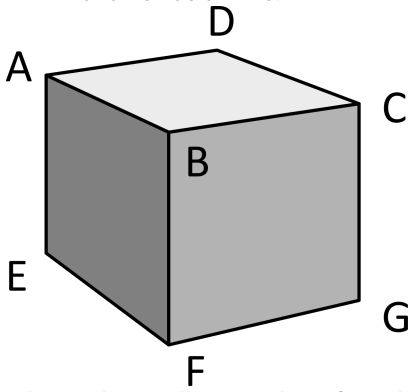
Let's say the 99th number in the first pattern is x , and the 100th number in the first pattern is y .

What is $x - y$?

- A) 0
 B) 99
 C) 1
 D) 100

(Correct +3, Wrong 0, Blank 0)

21. Ray has a cake in the shape of a cube as shown below and he has a knife.



What is the smallest number of cut that he needs to make to divide the cake into 6 parts? The parts don't have to be equal. (Write your answer only in numbers.) (Correct +4, Wrong 0, Blank 0)

22. Andy thinks of a positive integer. When that number is multiplied by 4, the last digit becomes 8.

If the original number is multiplied by 6, the last digit becomes _____. (Write your answer only in numbers.) (Correct +4, Wrong 0, Blank 0)

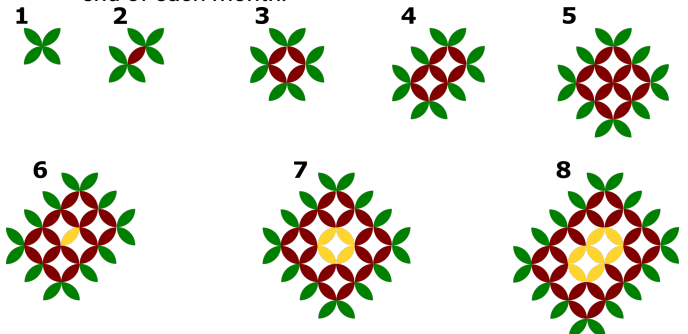
23. The password of Harry's phone consists of four nonzero even digits. The digits are all different and increasing from left to right.

What is the second digit (from the left) of Harry's password?

- A) 8
B) 4
C) 2
D) 6

(Correct +3, Wrong 0, Blank 0)

24. The following shows a growth of certain plants at the end of each month.



How many green leaves does the plants has at the end of its first year? (Write your answer only in numbers.)

(Correct +4, Wrong 0, Blank 0)

25. The area of trapezoid is given to be 3. The base of the trapezoid is 2, and the top side (parallel to base) is 1.

What is the height?

- A) 4
- B) 3
- C) 6
- D) 2

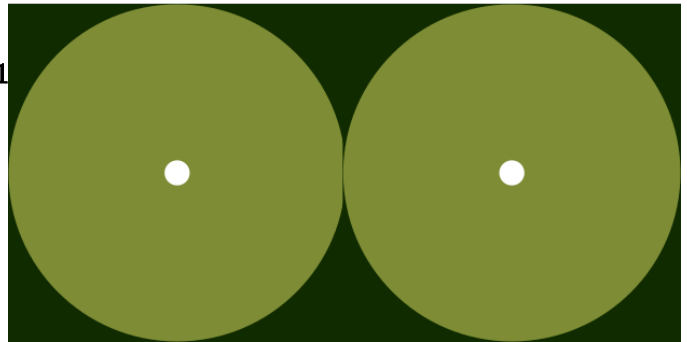
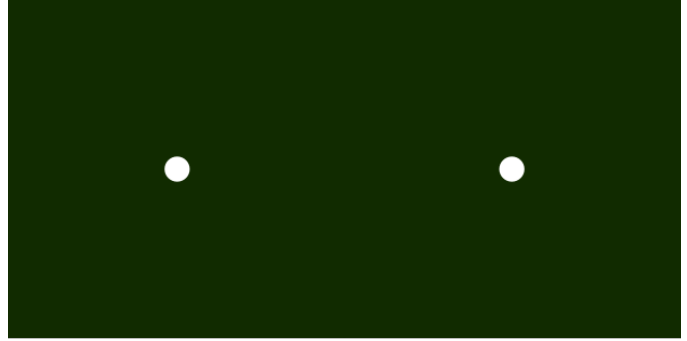
(Correct +3, Wrong 0, Blank 0)

26. When the numbers

$12 \times 34 \times 56 \times 78 \times 910 \times 1112 \times 1314 \times 1516 \times 1718 \times 1920$ are multiplied, the number of zero digits (unbroken) at the end is _____. (Write your answer only in numbers.)

(Correct +4, Wrong 0, Blank 0)

27. A neighborhood park has width of 10 meters and length of 20 meters. Two lamps are installed in a specific place as shown in the first picture. However the two lamps can only light its surrounding area up to 5 meters away from the lamp as shown in the second picture.



Find the area of the dark area in the park. (Use $\pi = 3.14$, and write your answer only in numbers.)

(Correct +4, Wrong 0, Blank 0)

28. It is said that team A has a 60% chance of winning a match against team B.

If A and B play 5 matches, how many times do we expect A to win against B?

- A) 3
- B) 2
- C) 1
- D) 4

(Correct +3, Wrong 0, Blank 0)

29. Usually Andy sleeps 7 hours a day. From March 28th, 2022 to April 1st, 2022, he slept 2 hours shorter than usual each day. From April 2nd, 2022 to April 5th, 2022, he slept 1 hour longer than usual each day.

How many hours did Andy sleep from March 28th, 2022 to April 5th, 2022? (Write your answer only in numbers.)

(Correct +4, Wrong 0, Blank 0)

30. From nine cards below Andy takes one card from each color. So in total he takes three cards. When he arranges the cards into a three-digit number in any order, he always gets an odd number.



How many ways can Andy take his cards? (Write your answer only in numbers.)

(Correct +4, Wrong 0, Blank 0)

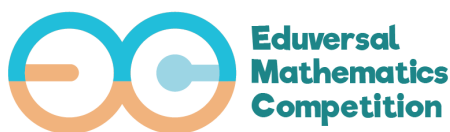
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Answer Keys

| No Key | | Code |
|--------|---|----------------|
| 1 | A | KMF/1995/DQI3Y |
| 2 | B | KMF/1979/PY4RD |
| 3 | B | KMF/2003/EBVYC |
| 4 | D | KMF/2057/O6Q14 |
| 5 | D | KMF/2015/FHKMD |
| 7 | C | KMF/2051/I91M2 |
| 8 | D | KMF/2041/IKFGW |
| 10 | D | KMF/1938/D62TG |
| 11 | D | KMF/1984/59FM8 |
| 12 | B | KMF/2039/CVMYF |
| 14 | C | KMF/2023/69S2Z |
| 15 | B | KMF/2054/APIIX |
| 16 | C | KMF/2014/JOKUG |
| 17 | D | KMF/1934/UU9QG |
| 18 | C | KMF/2049/97TLA |
| 19 | A | KMF/2056/RKINW |
| 20 | A | KMF/2043/JCYHH |
| 23 | B | KMF/1966/PYP8Y |
| 25 | D | KMF/2059/GVHPD |
| 28 | A | KMF/2055/YCJ44 |