

1. The following chart shows the result of final math examination in EMC academy.

What is the median of the data?

- A) 85
 B) 75
 C) 70
 D) 80
 (Benar +2, Salah 0, Kosong 0)

2. The following table shows the number of siblings of five students participating in a questionnaire.

Student	No. of siblings
Andy	3
Ben	2
Charlie	3
Don	x
Ed	y

If the mode of the data above is 2, what is the average of the data?

- A) 3.2
 B) 2.8
 C) 3.4
 D) 2.4
 (Benar +2, Salah 0, Kosong 0)

3. The difference between two numbers is 7, and the difference between the squares of those two is also 7.

What is the sum of the two numbers?

- A) 7
 B) 9
 C) 1
 D) 12
 (Benar +2, Salah 0, Kosong 0)

4. In the following trapezoid, AB and CD are parallel. A is 60° , B is 90° , and $AB = AD = 6$.

What is the area of trapezoid ABCD?

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

- (Benar +2, Salah 0, Kosong 0)

5. The following graph shows the number of book published up to a certain year by an author (cumulative). For example, up to the year 2000 the author has published 3 books in total.

According to the graph, what is the average number of book published per year by this author from 1997 up to 2002?

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

(Benar +2, Salah 0, Kosong 0)

6. George, Harris, and Isaac competed in a programming challenge to apply for a job as a programmer. In completing the challenge, George is twice as fast as Harris. But Isaac is three times as fast as Harris.

If George needed 1 hour to finish the challenge, how many minutes did Isaac take to complete it?

- A) 20
- B) 40
- C) 60
- D) 30

(Benar +2, Salah 0, Kosong 0)

7. Gina wants to make a pie chart showing the mode of transport used by students in her classroom. During her research, she found that her classmates is taking 4 different kinds of transportation: train, bus, bicycyle, and walking. She also found that that the number of students taking the train is twice as many as those taking bus and those taking bus is twice as many as those taking bicycle. The number of student taking bicycle is the same with those who walks to school.

In her pie chart, how many degrees she need to represent the student who takes train taking to school?

- A) 240
- B) 180
- C) 120
- D) 90

(Benar +2, Salah 0, Kosong 0)

8. In the following figure EAB is 30° , AB is perpendicular to BC, and BDE is 150° .

What is the measure of angle DEC?

Note: The figure is not to scale

- A) 90°
- B) 75°
- C) 120°
- D) 150°

(Benar +2, Salah 0, Kosong 0)

9. A swimming pool is equipped with three identical draining pipe. If only one of the draining pipe is opened, all the water in the pool is drained in 2 minutes. If two of the pipes are opened, the pool is drained in 1 minute.
How many second the pool will be drained if all of the draining pipes is opened?

- A) 40
 - B) 0
 - C) 15
 - D) 30
- (Benar +2, Salah 0, Kosong 0)

10. If the sides of the following cube ABCD.EFGH is 3, what is the area of the triangle AFH?

- A) $\frac{9}{2}$
- B) $\frac{3\sqrt{3}}{2}$
- C) $\frac{9\sqrt{3}}{2}$
- D) $\frac{3\sqrt{2}}{2}$

(Benar +2, Salah 0, Kosong 0)

11. Three real numbers a , b , and c have the following properties.

$$ab = 120$$

$$\frac{a}{c} = \frac{3}{4}$$

$$\frac{b}{c} = \frac{5}{2}$$

Calculate $\frac{ab}{c}$.

- A) 625
 - B) 25
 - C) 15
 - D) 225
- (Benar +2, Salah 0, Kosong 0)

12. An operation \square is defined as follow.

$$a \square b = a^2 + b^2$$

If $(3 \square x) \square 5 = 650$, what is one possible value of x ?

- A) 5
 - B) 4
 - C) 9
 - D) 3
- (Benar +2, Salah 0, Kosong 0)

13. An asset of a company grew 10% in January and then shrank by 10% in February, but again grew by 10% in March.

If at the beginning of the year the company asset is 1 million dollar, how much is its asset three months later?

- A) 1.089.000,- dollar
 - B) 1.000.000,- dollar
 - C) 1.100.000,- dollar
 - D) 1.090.000,- dollar
- (Benar +2, Salah 0, Kosong 0)

14. What is the percentage of area occupied by the bed as compared with the total area of the bedroom floorplan shown below?

- A) 20%
 - B) 15%
 - C) 30%
 - D) 25%
- (Benar +2, Salah 0, Kosong 0)

15. The following simplified map shows cities on an island. The lines represent motorway between those cities.

In how many different ways can Robby move from city A to city D, if he doesn't want to pass through the same city more than once?

- A) 2
 - B) 4
 - C) 1
 - D) 3
- (Benar +2, Salah 0, Kosong 0)

16. 200 gram of clay is needed to build a pyramid with height of 6 cm.

If the same amount of clay is used to build a cuboid with the same base as that of the pyramid, what would be the height of the cuboid in cm?

- A) 2
 - B) 18
 - C) 9
 - D) 6
- (Benar +2, Salah 0, Kosong 0)

17. The following figure is composed of two circles. The radius of the large one is 3 times as that of the small one.

If the area of the large circle is 27, what is the area of the shaded figure?

- A) 24
- B) 21
- C) 22
- D) 25

(Benar +2, Salah 0, Kosong 0)

18. Two-digit number \overline{AB} is twice the sum of its digits $A + B$.

What is the difference between the two digits?

- A) 7
- B) 1
- C) 8
- D) 9

(Benar +2, Salah 0, Kosong 0)

19. The following data shows the number of siblings that each student has in a classroom.

1, 1, 2, 2, 2, 3, 3, 4, 4, 4, 4, 4, 5, 5, 5, 6, x

If the mode, the median, and the mean of the data are all the same, what is x ?

- A) 6
- B) 13
- C) 8
- D) 7

(Benar +2, Salah 0, Kosong 0)

20. Ben bought one red coin and one blue coin and paid 3 dollars. Charlie bought one red coin and one green coin and paid 4 dollars. Donny bought one blue coin and one green coin and paid 5 dollars.

Ed bought two red coins. How much did he pay in dollars?

- A) 1
- B) 2
- C) 4
- D) 6

(Benar +2, Salah 0, Kosong 0)

21. The figure below is a regular **heptagon** centered at O.
What is the measure of angle OAB?
- A) 48°
 B) $\frac{450}{7}^\circ$
 C) $\frac{900}{7}^\circ$
 D) $\frac{225}{7}^\circ$
- (Benar +2, Salah 0, Kosong 0)

22. **What is the volume of a cube whose space diagonal is $\sqrt{12}$?**
- A) 8
 B) 4
 C) 2
 D) 3
- (Benar +2, Salah 0, Kosong 0)

23. In the following checkerboard we need to move a checker from square A to square B. In one move, we can only move the checker either one square to the right or one square down.
- How many ways can we go from A to B?**
- A) 15
 B) 5
 C) 10
 D) 25
- (Benar +2, Salah 0, Kosong 0)

24. Alfred, Benny, and Charlie are running a race. At a certain time near the end of the race, Alfred is 10 meters in front of Benny who is 5 meters in front of Charlie. Also, Alfred is 10 meters from the finish line. Now the three of them are running with their maximum speed. The ratio of Alfred's, Benny's, and Charlie's speeds are 3: 5: 6 respectively.
- Who will win the race?**
- A) They all reach the finish line simultaneously
 B) Benny
 C) Charlie
 D) Alfred
- (Benar +2, Salah 0, Kosong 0)

25. An urn contains 10 white balls and 8 black balls. Four balls are to be randomly taken from the urn. The combination of balls with the highest possibility is ____ white balls and ____ black balls.
- A) 4, 0
 B) 2, 2
 C) 3, 1
 D) 0, 4
 (Benar +2, Salah 0, Kosong 0)

26. The following are the results of physics final exam in my classroom.

No.	Name	Score
1	George	20
2	Harry	20
3	Ian	30
4	Jane	40
5	Kelsie	50
6	Liam	90
7	Meredith	90

- However, there is an error in the score of one student. Once the error is corrected, the class average rises by 10 points. If the maximum score of the exam is 100, what would be the median of the corrected data?
- A) 40
 B) 50
 C) 20
 D) 30
 (Benar +2, Salah 0, Kosong 0)

27. In the following equation x and y are integers.
 $2xy + 2x - 3y = 4$
 Which of the following shows the possible difference between x and y ?
- A) 5
 B) 7
 C) 1
 D) 3
 (Benar +2, Salah 0, Kosong 0)

28. In the following figure, the length of AB is $r\sqrt{2}$, where r is the radius of the circle.
 How many degrees is the measure of angle BCA?
- A) 60
 B) 30
 C) 45
 D) 15
 (Benar +2, Salah 0, Kosong 0)

29. A cube with total surface area of 12 is stretched so that its volume becomes 27 times of its initial volume. The stretching is uniform in all direction so that the cube's shape doesn't change.

What is its surface area after being stretched?

- A) 240
- B) 96
- C) 360
- D) 108

(Benar +2, Salah 0, Kosong 0)

30. Andy has two coins. The coins are rigged so that the probability of head is twice of that of tail.

Upon throwing his two coins simultaneously, what is the probability that Andy get one tail and one head?

- A) $\frac{4}{9}$
- B) $\frac{5}{9}$
- C) $\frac{1}{3}$
- D) $\frac{2}{3}$

(Benar +2, Salah 0, Kosong 0)

31. Four digit number $\overline{2x1y}$ is divisible by 15.

How many possible different pairs of x and y that satisfy the condition?

(Benar +4, Salah 0, Kosong 0)

32. What is the average of two positive integers if the result of addition and multiplication of the two integers are the same?

(Benar +4, Salah 0, Kosong 0)

33. How many pairs of positive integers x, y satisfy the following inequality?

$$\frac{x^2 + 2y^2}{3} \leq 2 - xy$$

(Benar +4, Salah 0, Kosong 0)

34. A data contains n numbers, not all of them are identical. But the data has the same mean, median, and mode.

What is the smallest possible value of n ?

(Benar +4, Salah 0, Kosong 0)

35. Two digits positive integer \overline{AB} is said to be fine number if $\overline{AB}^2 = \overline{CDEF}$ which is a four digits number with $\overline{CD} = A^2$ and $\overline{EF} = B^2$.

How many fine numbers are there? Note: \overline{CDEF} cannot contain 0 as leading digit.

(Benar +4, Salah 0, Kosong 0)

36. Lines AB and BC are tangent to the circle at point D and E.

If $BD = 15$ and the area of the circle is 64π , what is the distance between B and the center of the circle?

(Benar +4, Salah 0, Kosong 0)

37. How many different numbers can be arranged from all the digits of 2021, if the leading digit cannot be 0?

(Benar +4, Salah 0, Kosong 0)

38. Andy's password consists of 6 nonzero digits that are strictly increasing from left to right.

How many different possibilities for Andy's password?

(Benar +4, Salah 0, Kosong 0)

39. In the following figure, ABCD is a square, M is a point on AB, and N is a point on AD such that $MB=3AM$ and $AN=3ND$.

What is the area of triangle CMN if the area of the square ABCD is 32?

(Benar +4, Salah 0, Kosong 0)

40. In the figure below, AB and CD are two lines with length 12 and 24. They intersect at right angle on O. Also, square OBED has twice as the area of triangle AOC.

What is the length of EB?

(Benar +4, Salah 0, Kosong 0)