FSP MATHEMATICS CONTEST

2022

QUESTION BOOKLET

GRADE 9 & 10

VIBRANT YOUNGSTERS

TIME ALLOWED: 75 Mins.

Maximum Marks: 60

INTERNATIONAL FAMOUS STUDENTS PLATFORM
VIBRANT YOUNGSTERS COMPETITIONS

INSTRUCTIONS

1) DON'T START ATTEMPTING THE PAPER UNTIL INSTRUCTED BY THE INVIGILATOR.

2) INSTRUCTIONS FROM THE EXAMINATION INVIGILATOR MUST BE CARRIED OUT PROMPTLY.

3) CAREFULLY RECHECK YOUR NAME, FATHER NAME, SCHOOL NAME, ADDRESS ETC AT THE BUBBLE SHEET / ANSWER SHEET.

4) RECORD ALL ANSWERS ON THE BUBBLE SHEET ONLY. SELECT BEST ANSWER FROM THE FOUR GIVEN OPTIONS AND MARK ONLY ONE OPTION IN EACH QUESTION.

5) USE BLUE / BLACK INK TO FILL UP THE CIRCLES FOR YOUR ANSWERS ON THE BUBBLE SHEET. USE OF LEAD PENCIL IS NOT ALLOWED.

6) USE OF ANY HELPING MATERIAL INCLUDING CELL PHONES AND ELECTRONIC DEVICES IS STRICTLY PROHIBITED.

7) EVERY CORRECT ANSWER EARNS THREE POINTS. THERE WOULD BE NEGATIVE MARKING. ONE POINT WOULD BE DEDUCTED FOR EVERY INCORRECT ANSWER.

8) CANDIDATES MAY NOT LEAVE THE EXAMINATION ROOM UNESCORTED FOR ANY REASON, AND THIS INCLUDES USING THE WASHROOM.

9) NO MATERIALS OR ELECTRONIC DEVICES SHALL BE BROUGHT IN TO THE ROOM.

10) THERE ARE FIVE CATEGORIES OF THE CONTEST AS UNDER:

A) VIBRANT YOUNGSTERS (GRADE l & 2)

B) VIBRANT YOUNGSTERS (GRADE 3 & 4)

C) VIBRANT YOUNGSTERS (GRADE 5 & 6)

D) VIBRANT YOUNGSTERS (GRADE 7 & 8)

E) VIBRANT YOUNGSTERS (GRADE 9 & 10 / 0-LEVELS)

11) ONLY REGISTERED STUDENTS CAN PARTICIPATE INTHE CONTEST.

12) NO CANDIDATE SHALL TAKE OUT OF THE HALL ANY ANSWER BOOK(S) OR PART OF AN ANSWER BOOK, WHETHER USED OR UNUSED, OR OTHER SUPPLIED MATERIAL.

13) IF A PARTICIPANT DOES NOT UNDERSTAND A WORD OR PHRASE ON THE EXAM PAPER, NEITHER EXAMINER NOR INVIGILATOR IS PERMITTED TO ANSWER.

14) FOR INFORMATION ABOUT UPCOMING CONTESTS OR PROVIDING VALUABLE FEEDBACK, PLEASE VISIT fspcompetitions.org

15) ANY ACADEMIC MISCONDUCT OR MALPRACTICE MUST BE REPORTED TO FSP VIBRANT YOUNGSTERS AT info@fspcompetitions.org

THE MATH THERAPY

By Fatima Ilyas.

(Principal Roots IVY World Signature School, Islamabad)

Some memories are just there to stay. On my first day in college, we were addressed by our head mistress who was a Math wizard. I still remember her words when she said "be a critical thinker and you will never fail in life". Being a curious and inquisitive student, I immediately asked "As to how can one evolve into a critical thinker"? She went on to offer some advice. "Take more math and take it seriously" Why? Because "I can think of no better tool than mathematics to develop the crucial skill of quantitative and critical thinking to process the information that is thrown at me."

What she meant was that if we don't have the ability to process quantitative information in a mathematical way, we can often make decisions that are based on our beliefs, social barriers and fears rather than on reality. On an individual level, if we have the ability to think mathematically we can make better decisions to counter risky and critical life situations.

Mathematics is essential to our world, since its knowledge is transferable to many disciplines. Engineering, Science, and Technology have contributed to great inventions in the world, with experts in all those fields having outstanding mathematic skills. The importance of mathematics is not only crucial for scientists or engineers, but it helps develop skills, such as analyzing data, seeking evidence and recognizing patterns every day. It develops our mental skills towards a better understanding or interpretation of information. Each day brings challenges and problems and by learning the art of using numbers in the right way will help you think critically and creatively by enhancing your problem solving skills in day to day life. In the words of the famous American mathematician Katherine Johnson "There will always be science, engineering, and technology. And there will always, always be mathematics".

1) A ladder leans against the wall at the point B (window end) from a ground level and makes an angle horizontally at 52°. The height of ladder is 15 m. When the same ladder leans above the point B at point A (window start) and makes an angle of 85° horizontally. The distance between point A and point B is:

(A) 12.4 m (B) 5 m (C) 4.12 m (D) 3.12 m

2) If sin A is 0.865 then the value of angle A (four significant figures) is:

(A) 85.59° (B) 59.88° (C) 62.88° (D) 88.62°

3) The value of the expression [cosec (75° + θ) – sec (15° – θ) – tan (55° + θ) + cot (35° – θ)] is:

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

4) If cos 9α = sinα and 9α < 90°, then the value of tan 5α is:

(A) 1/√3 (B) √3 (C) 1 (D) 0

5) Find the sum of the observations if the mean is 23 and the number of the observations is 11?

(A) 283 (B) 256 (C) 293 (D) 253

6)The difference between the maximum and minimum values of the given observation is called:

(A) Class (B) Class interval (C) Class mark (D) Range

7) In a hospital, weights of new born babies were recorded, for one month. Data is as shown:

Weight of new born baby (in kg)	1.4 - 1.8	1.8 - 2.2	2.2 - 2.6	2.6 - 3.0
No of babies	3	15	6	1

Then the median weight is:

(A) 2kg (B) 2.03kg (C) 2.05 kg (D) 2.08 kg

8) Mean of 100 items is 49. It was discovered that three items which should have been 60, 70, 80 were wrongly read as 40, 20, 50 respectively. The correct mean is:

(A) 48 (B) 49 (C) 50 (D) 60

9) For the following distribution:

Marks	0-10	10-20	20-30	30-40	40-50
No of students	3	9	13	10	5

the number of students who got marks less than 30 is:

(A) 13 (B) 25 (C) 10 (D) 12

10) For the following distribution:

C.I.	0-10	10-20	20-30	30-40	40-50
f	20	30	24	40	18

the sum of lower limits of the modal class and the median class is:

(A) 20 (B) 30 (C) 40 (D) 50

11) $\log_a mn$ equals to:

(A) $\log_a m + \log_a n$
(B) $\log_a m - \log_a n$
(C) $n \log_a m$
(D) $\log_b n \times \log_a b$

12) Differentiate $8e^{-x}+2e^{x}$ w.r.t x.

(A) $2e^{-x}+8e^{x}$
(B) $2e^{x}+8e^{-x}$
(C) $2e^{-x}-8e^{x}$
(D) $2e^{x}-8e^{-x}$

13) The largest number that divides 70 and 125, which leaves the remainders 5 and 8, is:

(A) 65 (B) 15 (C) 13 (D) 25

14) The decimal expansion of the rational number $23/(2^2 . 5)$ will terminate after:

(A) one decimal place
(B) two decimal places
(C) three decimal places
(D) more than 3 decimal places

15) If the HCF of 65 and 117 is expressible in the form 65m – 117, then the value of m is:

(A) 4 (B) 0 (C) 1 (D) 3

16) There are 312, 260 and 156 students in class X, XI and XII respectively. Buses are to be hired to take these students to a picnic. Find the maximum number of students who can sit in a bus if each bus takes equal number of students.

(A) 52 (B) 56 (C) 48 (D) 63

17) There is a circular path around a sports field. Priya takes 18 minutes to drive one round of the field. Harish takes 12 minutes. Suppose they both start at the same point and at the same time and go in the same direction. After how many minutes will they meet?

(A) 36 minutes
(B) 18 minutes
(C) 6 minutes
(D) They will not meet

18) If two positive integers m and n are expressible in the form $m = pq^3$ and $n = p^3q^2$ where p, q are prime numbers, then HCF (m, n) =

(A) pq (B) pq^2 (C) p3q^3 (D) p2q^3

19) Which of the following is an example of the quadratic polynomial?

(A) $^7x+^3$
(B) $^2x^2+x-^1$
(C) $x+^3x^3-^9$
(D) None of the above

20) If $x^2+kx+^6 = (x+^2)(x+^3)$ for all k, find the value of k.

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

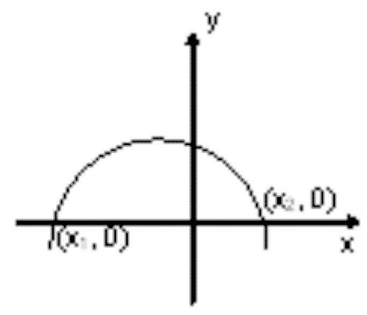
21) The graph of linear equation x+2y = 2, cuts the y-axis at:

(A) (2,0) (B) (0,2) (C) (0,1) (D) (1,1)

22) Two quadratic equations in which xy term is not present and coefficients of x2 and y2 are equal, give a —— by subtraction.

(A) Parabola
(B) Homogeneous equation
(C) Quadratic equation
(D) Linear equation

23) The diagram shows the graph of y = ax2 + bx + c, then:



(A) a > 0 (B) b < 0 (C) c > 0 (D) b2 – 4ac = 0

24) If α & β are the roots of the equation $ax^2 + bx + c = 0$, then ($a \neq 0$)

(A) $a(\alpha+\beta) + c = 0$
(B) $a(\alpha+\beta) + b = 0$
(C) $a + \alpha+\beta = 0$
(D) $b(\alpha+\beta) + a = 0$

25) The radius of a hemispherical balloon increases from 6 cm to 12 cm as air is being pumped into it. The ratio of the surface areas of the balloon in the two cases is:

(A) 1:4 (B) 1:3 (C) 2:3 (D) 2:1

26) Match the column:

(1) Surface area of cuboid	(A) $\pi r^2 h$
(2) Surface area of closed right cylinder	(B) $2\pi r\,(h + r)$
(3) Total surface area of right cone	(C) $\pi rl + \pi r^2$
(4) Total surface area of hemisphere	(D) $3\pi r^3$ (E) $3\pi r^2$ (F) $2[lb + bh + lh]$

(A) 1 → A, 2 → C, 3 → D, 4 → E
(B) 1 → F, 2 → B, 3 → C, 4 → E
(C) 1 → B, 2 → C, 3 → D, 4 → E
(D) 1 → F, 2 → E, 3 → C, 4 → A

27) A cube whose edge is 20 cm long, has circles on each of its faces painted black. What is the total area of the unpainted surface of the cube if the circles are of the largest possible areas?

(A) 90.72 cm² (B) 256.72 cm² (C) 330.3 cm² (D) 514.28 cm²

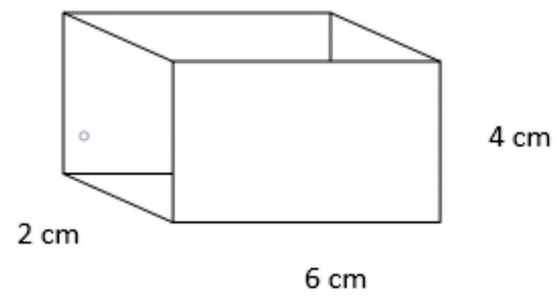
28) What is the Total Surface Area of a Cylinder?

(A) 2πr²(r+h) Cubic Units
(B) 4πr²(r+h) Sq. Units
(C) 2πr(r+h) Cubic Units
(D) 2πr(r+h) Sq. Units

29) What is the Volume of a cuboid of length: 24 cm, breadth: 16 cm, and height: 7.5 cm?

(A) 2980 cm³ (B) 1880 cm³ (C) 2880 cm³ (D) 2440 cm³

30) Find the surface area of the given cuboid.



(A) ^{44} cm² (B) ^{22} cm² (C) ^{40} cm² (D) ^{88} cm²

Best of Luck!

ANSWER SHEET

INSTRUCTIONS:

- This is a generic answer sheet to be used by participants of all grades. Students of Grade 1-2 will fill in circles of first 20 questions. Grade 3-4 will fill in circles of 25 questions & Grade 5-10 will fill in circles of 30 questions.
- Please recheck your Name, Father Name, Garde & School written below, the same would appear at your certificate.
- Use of lead pencil is not allowed.
- Use only Black / Blue ink to fill in the circles.

Choose only ONE of the FOUR proposed answers (A,B,C or D) & fill in the circles with your answer.

Example of correctly filled table of answers.

Ⓐ Ⓑ ● Ⓓ **Correct Filling Answer "C"**

Ⓐ Ⓑ ⊗ Ⓓ **wrong filling**

Ⓐ Ⓑ ✓ Ⓓ **wrong filling**

Ⓐ Ⓑ ■ Ⓓ **wrong filling**

Ⓐ Ⓑ● Ⓒ Ⓓ **wrong filling**

Q. No.	Answer				Q. No.	Answer			
1	A	B	C	●	16	●	B	C	D
2	A	●	C	D	17	●	B	C	D
3	A	●	C	D	18	A	●	C	D
4	A	B	●	D	19	A	●	C	D
5	A	B	C	●	20	A	B	C	●
6	A	B	C	●	21	A	B	●	D
7	A	B	●	D	22	A	B	C	●
8	A	B	●	D	23	A	B	●	D
9	A	●	C	D	24	A	●	C	D
10	A	B	C	●	25	●	B	C	D
11	A	B	●	D	26	A	●	C	D
12	A	B	C	●	27	A	●	C	D
13	A	B	●	D	28	A	B	C	●
14	A	●	C	D	29	A	B	C	●
15	A	●	C	D	30	A	B	●	D
					31	A	B	C	●

Vibrant Youngsters Competitions

INTERNATIONAL FAMOUS STUDENTS PLATFORM
VIBRANT YOUNGSTERS COMPETITIONS

FSP Vibrant Youngsters A Project of Famous Stationary & Paper products.
We deal in all kind of printing & stationary.

042-37123334 , 03367123334

fspcompetitions.org, info@fspcompetitions.org