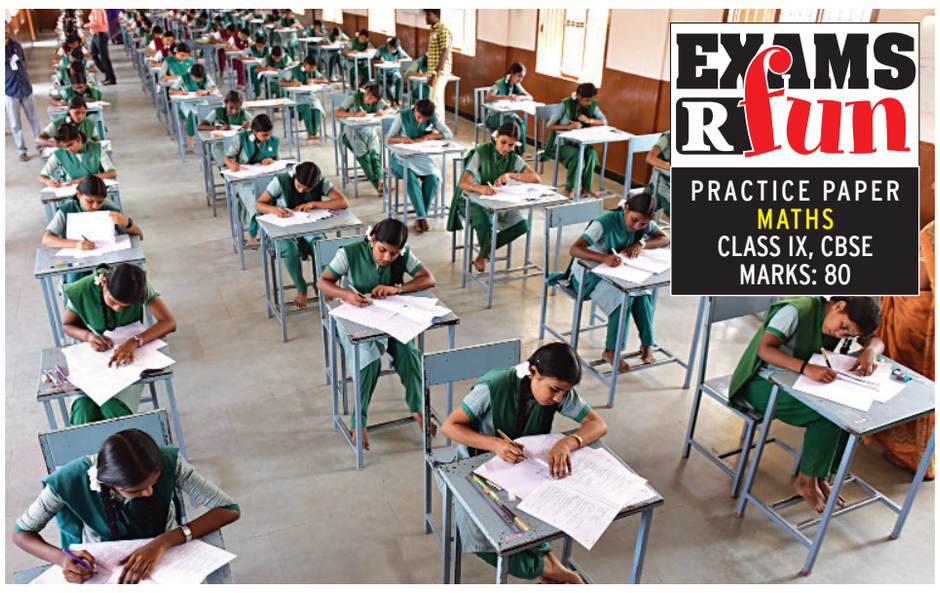
"The three great essentials to achieve anything worth while are: Hard work, Stick-to-itiveness, and Common sense." Thomas A. Edison

DO THE MATH & FIGURE IT OUT

Exam cell, St. Kabir High School, Ahmedabad, offers you a practice Maths paper to see where you stand in the subject



SECTION - A

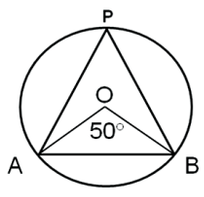
Answer the following: [6]

Q.1 Find the value of k, if x - 1 is a factor of $4x^3 + 3x^2 - 4x + k$

Q.2 If the angles of a triangle are in the ratio 5:3:7 then what will be the nature of the triangle and find out all angles.

Q.3 ABCD is a rhombus AO = 6 cm and DO = 8 cm. Find the perimeter of the rhombus.

Q.4 AB is a chord in a circle centered at O and P is any point on the other side of the chord. If $\angle AOB = 50^\circ$ find $\angle APB$



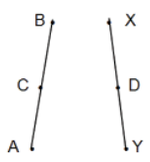
Q.5 If the radius of a new sphere is half of the radius of the given sphere, find out the ratio of volume of new sphere to the volume of the given sphere.

Q.6 A coin is tossed 1000 times with following frequency:
Head - 455 ; Tail - 545 . Compute the probability for each event.

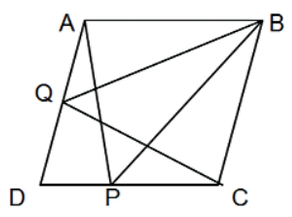
SECTION - B

Q.7 Factorize: $x^2 + 3\sqrt{3}x + 6$ by splitting the middle term. [12]

Q.8 In the given figure AC = XD, C is the midpoint of AB and D is midpoint of XY, using an Euclid's axiom show that AB = XY.

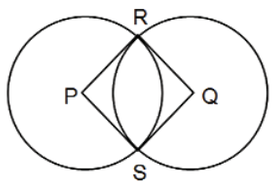


Q.9 P and Q are any two points lying on the sides DC and AD respectively of a $\square^m$ ABCD. Show that Ar (APB) = Ar (BQC)



Q.10 Write four solutions of 2x + y = 7

Q.11 In the given figure, two circles with centres P and Q intersect at R and S. Prove that $\angle PRQ = \angle PSQ$.



Q.12 The radius and height of a cylinder are in the ratio 2:3, If the volume of the cylinder is $16/7\ cm^3$ find its height.

SECTION - C

Q.13 Show that 0.235353535 - - - - can be expressed in the form p/q where p and q are integers and $q \neq 0$.

Q.14 Factorise the following:

a. $X^2 + \frac{x}{4} \quad \frac{1}{8}$

b. $2a^3 - 3a^2 - 17a + 30$

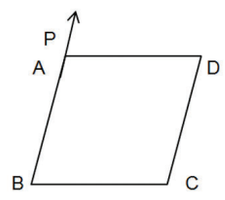
Q.15 Plot the points (-3,0) , (5,0) and (0,4) on Cartesian plane. Name the figure formed by joining these points and find its area.

Q.16 Show that in a right triangle the hypotenuse is the longest side.

Q.17 Show that the bisectors of angles of a parallelogram form a rectangle.

OR

ABC is an isosceles triangle in which AB = AC. AD bisects exterior $\angle PAC$ and CD || AB. Show that $\angle DAC = \angle BCA$ and ABCD is a parallelogram.



Q.18 A company manufactures car batteries of a particular type. The lives (in years) of 40 such batteries were recorded as follows:

2.6	3.0	3.7	3.2	2.2	4.1	3.5	4.5
3.5	2.3	3.2	3.4	3.8	3.2	4.6	3.7
2.5	4.4	3.4	3.3	2.9	3.0	4.3	2.8
3.5	3.2	3.9	3.2	3.2	3.1	3.7	3.4

Construct a grouped frequency distribution table for this data, using class intervals of size 0.5 , starting from the interval 2 - 2.5.

OR

Obtain mean of the following data.

Variable (x_i)	4	6	8	10	12
Frequency (f_i)	4	8	14	11	03

Q.19 If the points A (3, 5) and B (1, 4) lie on the graph ax + by = 7, find the value of a and b.

Q.20 If the non-parallel sides of a trapezium are equal, prove that it is cyclic.

OR

Three friends A, B and Care playing a game by standing on a circle of a radius 5 m drawn in a park. A throws a ball to B , B to C , C to A. If the distance between A to B and B to C is 6 m each, find the distance between A to C.

Q.21 The pillars of a temple are cylindrically shaped. If each pillar has a circular base of radius 20 cm and height 10 m. How much concrete mixture would be required to build 14 such pillars?

OR

The length of a 10 cm high cuboid exceeds its breadth by 4 cm. If volume of the cuboid is 2210 cm^3 find its length.

Q.22 Following table shows the marks scored by a group of 90 students in a Math test of 100 marks.

Marks	0-20	20-30	30-40	40-50	50-60	60-70	70-100
No. of students	7	10	10	20	20	15	8

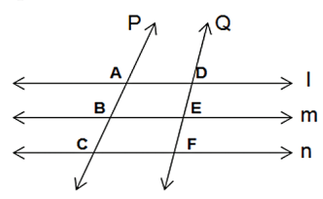
Find the probability that student obtained:
a) Less than 20 marks.
b) 60 or more marks.
c) Above 70 marks.

SECTION - D

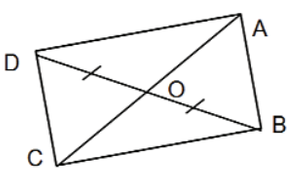
Q.23 A traffic signal board indicating 'School Ahead' is an equilateral triangle with side 'a'.
a. Find the area of signal board using sides.
b. If the perimeter is 180 cm, what will be the area of signal board?
c. Which mathematical concept is used to find area?
d. Which value is depicted in this problem?

Q.24 Prove that in a triangle perimeter is greater than sum of altitudes.

Q.25 l, m and n are three parallel lines intersected by transversals p and q such that l, m and n cut off equal intercepts AB and BC on p. show that l, m and n cut off equal intercepts DE and EF on q also.

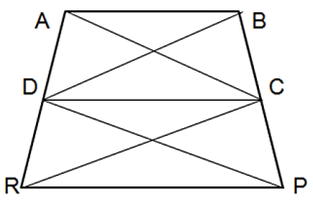


Q.26 In the given figure diagonal AC and BD of a quadrilateral ABCD intersect O such that OB = OD If AB = CD then show that
a. Ar (ΔDOC) = Ar (ΔAOB)
b. Ar (ΔDCB) = Ar (ΔACB)
c. DA || CB or ABCD is a parallelogram



OR

In the given figure ar (DRC) = ar (DPC) that ar (BDP) = ar (ARC). Show that both the quadrilateral ABCD and DCPR are trapezium.

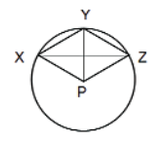


Q.27 The taxi fare in a city is as follows: For the 1st kilometer the fare is Rs. 8 , for the subsequent distance it is Rs. 5 per km. Taking the distance covered as x km and total fare as Rs. y write linear equation for this information and draw its graph.

Q.28 Prove that the angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle.

OR

In given figure P is the centre of the circle. Prove that $\angle XPZ = 2(\angle YXZ + \angle XZY)$



Q.29 A dome of a building is in the form of a hemisphere. From inside, it was white washed at the cost of Rs. 498.96. If the cost of white washing is 2.00Rs. per sq m. find.
a) Inside surface area of dome
b) Volume of the air inside the dome.

Q.30 Construct a ΔABC in which $\angle B = 60^\circ$ and $\angle C = 45^\circ$ and AB + BC + CA = 11 cm.

OR

Construct a right angled triangle in which the hypotenuse measure 5 cm and length of one of the side containing the right angle is 4.2. cm.

These questions and the marks alongside are meant for practice purpose only. Students are advised to check format, syllabus and marks for Board test papers with their teachers. Questions have been given by teachers and NIE is not responsible for them.

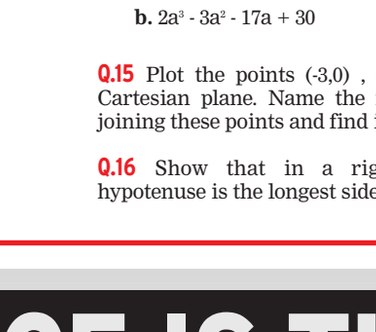
BALANCE IS THE KEY

1 I have followed a daily study plan since elementary school and been **up to date on my homework** and studies because I believe it's important to have a routine.

2 My study plans for the year include a **meticulously created timetable** where learning, revising, sleeping and recreation time are all appropriately balanced.

3 Sleep and recreation are very important to me. **Occasional recreational activities** such as playing or watching a movie relaxes the mind. So I will strive to maintain this balance throughout the year.

For many students, Class X gives them the jitters – they regard it as a daunting academic year because of the Board examinations. For me, this is not the case as I plan to follow a simple regimen

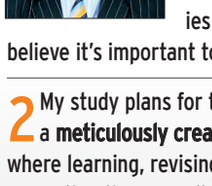


4 Equally important is **revision.** I usually undergo regular revision tests of a few sub-topics at a time to make sure the concepts are clear. For subjects like mathematics, it's important to **study and practice every day.** I do not hesitate to ask questions at school and try to remain calm during exams.

5 Since this academic year is very crucial, mental and physical health should not be overlooked; keeping a balance is the key. I believe in studying well, having fun and **taking care of my health.**

Eshupriyeh Belgotra, MYP 5 (Class X), NES International School, Mumbai, IB World School

'Be regular and attentive'



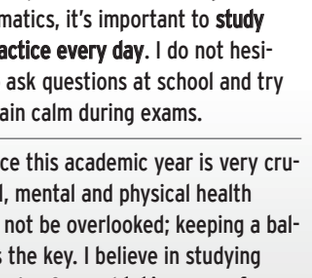
Yashika Gupta, scored 98.2% in Class XII, CBSE, from Rani Lakshmi Bai Memorial School, Lucknow

Q Describe briefly the study plan you followed while preparing for the boards?
I paid complete attention to lessons at school and stayed in touch with my teachers. I prepared for the exams with the help of various practice sessions and exam papers. With the help of my mother who encouraged me and my teachers, I could excel.

Q What were the key challenges and how did you overcome them?
Problem solving with seniors helped me – as they explained the logic behind tackling a question in a certain way. I made study schedules which gave me free time and kept me stress-free. More importantly, I never left anything for the last minute.

Q How did you deal with pressure to perform?

MARKS SECURED	
English	98
Business Studies	98
Accounts	95
Economics	100
Informatics Practices	100



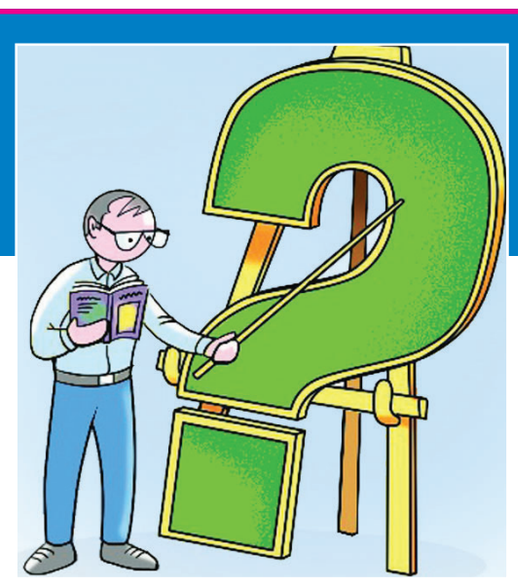
My parents played a huge role in easing my stress. Stress was something that proved to be a big hurdle as I was away from home during the preparations. My mother counselled me from our hometown. She would constantly guide me.

Q How did you motivate yourself?
I believe hard work pays. I was studious from the beginning. I just needed to chalk out plans and strategise my timetable for study hours. My inspiration came from my parents because they motivated me to do better at each stage of my life.

Q How did you balance academics with other activities?
Generally there was not much time to think of other activities as I was always focused on my academics.

Q What would you like to tell future aspirants?
Being regular and attentive at school is something I believe in. I would suggest my juniors to do it too.

Love English to love all subjects



If you can comprehend English, you can perhaps understand most other subjects in school. It is imperative that students pay attention to the Queen's language if they want to get ahead in life. The flexibility of the language is one of its greatest advantages – which makes its use possible in fields like medicine, business, finance...

THE THREE-TECHNIQUE METHOD CAN BE IMPLEMENTED TO IMPROVISE THE LANGUAGE OF ENGLISH. IT IS AS FOLLOWS:

1 IMMERSION
Here the student applies his or her knowledge of English, rather improvises it, by going away from the school environment and interacting with unknown people in an unknown/foreign place.

2 SOCIAL LEARNING
Learning English through making friends, interacting with them and in that process learning or improvising the language.

3 FLASH CARD TECHNIQUE
The best way to learn English and improvise it is by making flash cards of various words, sentences and looking at the cards every now and then which helps brush up the language.

A NUMBER OF TECHNIQUES CAN BE ADOPTED BY STUDENTS TO IMPROVE THEIR WRITING AND SPEAKING SKILLS

(a) Read as many inspirational books as possible, and the daily newspaper, to learn new words and improvise the language.

(b) Speak as much as possible in English with people from various fields.

(c) For the sharpening of writing skills, students can take up new innovative topics and express their ideas.

(d) Interact with seniors and juniors in school. Have an interview-like session and jot down the points. This will polish both speaking and writing skills.

(e) To learn just one word from the dictionary every day and add to one's vocabulary would be a sensible step towards learning English.

(f) Hearing motivational speakers will enhance the speaking ability of the students thereby increasing their language skills and confidence.

(g) Students should take part in literary activities like essay writing, debates, speech, etc., and also get involved in writing diaries or reports of events in school to improvise their language.

Revathi Iyer, Holy Angel's School, Dombivli (East), Mumbai