

DSB INTERNATIONAL PUBLIC SCHOOL

RISHIKESH UTTARAKHAND

CLASS X

| SUBJECT | HOLIDAY HOMEWORK |
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| ENGLISH | <ol style="list-style-type: none">1. Based on the lesson Nelson Mandela – a long walk to freedom prepare an art integrated project.2. Make a poster on the life and struggle of Nelson Mandela.3. Prepare a Podcast based on famous speech ‘I am prepared to die’ by Nelson Mandela.4. Read a book during summer vacation and write a review about it.5. Letter writing<ul style="list-style-type: none">- Write a letter to the Editor of the times of India, highlighting technological addiction among youth- Write a letter to M/S oxford publishing house, London complaining that the books sent by them were not those you had ordered for. Ask for a replacement. You are Varun Joshi, Sector – 20, Chandigarh |
| SCIENCE | <p style="text-align: center;">Physics- Compulsory to All (Paste this paper in your holiday homework notebook)</p> <p style="text-align: center;"><u>NUMERICALS BASED ON CONVEX AND CONCAVE MIRRORS</u></p> <p>Q1. A 4.5 cm needle is placed 12 cm away from a convex mirror of focal length 15 cm. Give the location of image and the magnification. Describe what happens as the needle is moved farther from the mirror.</p> |

- Q2.** An object 2 cm high is placed at a distance of 16 cm from a concave mirror, which produces 3 cm high inverted image. What is the focal length of the mirror? Also, find the position of the image.
- Q3.** Draw any three ray diagrams to show how the size and nature of an image of an object change when it moves from center of curvature of concave mirror to the pole of the mirror.
- Q4.** The image formed by a convex mirror of focal length 20 cm is $\frac{1}{4}$ times of size of the object. Calculate the separation between object and image. Also form the ray diagram.
- Q5.** A concave mirror of focal length 40 cm formed the image has size 4 times of size of object. Calculate the two possible position of object and draw the ray diagram for both.
- Q6.** When an object is placed at a distance of 60 cm from a convex mirror, the magnification produced is $\frac{1}{2}$. Where the object should be placed to get a magnification of $\frac{1}{3}$?
- Q7.** An object is placed at a large distance in front of a convex mirror of radius of curvature 40 cm. How far the image behind the mirror?
- Q8.** The image formed by a concave mirror is real and 4 times of the size of object. If the focal length of the mirror is 100 cm. calculate the position of object and image.
- Q9.** Calculate the range of the position of object, if the image formed by a concave mirror is virtual and focal length is 60 cm.
- Q10.** An object is placed in front of a convex mirror of radius of curvature 80 cm, at 40 cm. Calculate the position and nature of image produced by the mirror.

NUMERICALS BASED ON CONVEX AND CONCAVE LENSES

- Q1.** Light travels through water with a speed of 2.25×10^8 m/s. What is the refractive index of water?
- Q2.** Light travels from rarer medium 1 to a dense medium 2. The angle of incident and refraction are respectively 45° and 30° . Calculate the (i) refractive index of medium 2 with respect to medium 1 and (ii) refractive index of medium 1 with respect to the medium 2.
- Q3.** How much time will take to cross 2mm thick glass pane if refractive index of glasses is $\frac{3}{2}$?

- Q4.** An object is placed at a distance of 100 cm from a converging lens of focal length 40 cm. What is the nature and position of image?
- Q5.** A lens of focal length 20 cm is used to produce a ten times magnified image of a film slide on a screen. How far must the slide be placed from the lens?
- Q6.** A convex lens of focal length 6 cm is held 4 cm from a newspaper, which has print 0.5 cm high. By calculation, determine the size and nature of the image produced.
- Q7.** The magnification of a spherical lens is +0.5. What is the nature of lens and image?
- Q8.** An object is placed at a distance of 50 cm from a concave lens produces a virtual image at a distance of 10 cm in front of the lens. Draw a diagram to show the formation of image. Calculate focal length of the lens and magnification.
- Q9.** The image produce by a convex lens is virtual and 6 times of size of object. If the focal length of the lens is 25 cm. Calculate the position of object and image.
- Q10.** The image produced by a convex lens is real and distance of image is 3 times of the distance of object. If the focal length is 40 cm, then calculate the magnification position of object.

Biology

- Q1.** Prepare a puzzle game on the following Life processes (3-4 puzzle each)
- Respiration
 - Nutrition
- Q2.** Write the journals related to the following topics with word limits 100-150.
- Role of Enzyme in digestion
 - Role of blood in transport and excretion

Chemistry

- Q1.** Prepare a lab notebook by writing the following experiments:

Aim: Performing and observing the following reactions and classify them into:

- a) Combination reaction
- b) Decomposition reaction
- c) Displacement reaction

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| | <p>d) Double-displacement reaction</p> <ol style="list-style-type: none"> i. Action of water on quick lime ii. Action of heat on ferrous sulphate crystals iii. Iron nails kept in copper sulphate solution iv. Reaction between sodium sulphate and barium chloride solution |
| MATHS | <ol style="list-style-type: none"> 1. Prepare an art integrated project on world's great mathematicians (any 5). Write about their life, their work and their contribution in mathematics 2. Do the sums from the given worksheet in a separate notebook? |
| | <p>Note: - Revise for unit test. - Make 4 Eco bricks during your summer break and bring it when school reopens. https://youtu.be/INgAW4VRcKo</p> |

HOLIDAY HOMEWORK (2022-2023)

Class 10 - Mathematics

1. In a seminar, the number of participants in Hindi, English and Mathematics are 60, 84 and 108, respectively. Find the minimum number of rooms required if in each room the same number of participants are to be seated and all of them being in the same subject.
2. Find the LCM and HCF of 336 and 54 and verify that $\text{LCM} \times \text{HCF} = \text{product of two numbers}$.
3. Find the HCF and LCM of the following pairs of positive integers by applying the prime factorization method: 72, 90
4. There is a circular path around a sports field. Sonia takes 18 minutes to drive one round of the field, while Ravi takes 12 minutes for the same. 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 again at the starting point?
5. Find the LCM of the following polynomials: $x(8x^3 + 27)$ and $2x^2(2x^2 + 9x + 9)$
6. Find the zeroes of the polynomial $y^2 + \frac{3}{2}\sqrt{5}y - 5$ by factorisation method and verify the relationship between the zeroes and coefficient of the polynomials.
7. Find the zeroes of the polynomial $f(x) = x^3 - 5x^2 - 2x + 24$, if it is given that the product of its two zeros is 12.
8. If α and β are the zeros of the polynomial $f(x) = 6x^2 + x - 2$, find the value of $\left(\frac{\alpha}{\beta} + \frac{\beta}{\alpha}\right)$
9. Verify that 2, 1, 1 are the zeroes of the cubic polynomial $x^3 - 4x^2 + 5x - 2$. Also, verify the relationship between the zeroes and coefficients.
10. Find a quadratic polynomial whose sum and product of the zeroes are $\frac{21}{8}$ and $-\frac{5}{16}$ respectively. Also find the zeroes of

the polynomial by factorisation.

11. Draw the graphs of the following

$$2x - y - 2 = 0$$

$$4x + 3y - 24 = 0$$

$$y + 4 = 0$$

Obtain the vertices of the triangle so obtained. Also, determine its area.

12. Abdul travelled 300 km by train and 200 km by taxi taking 5 hours 30 minutes. But, if he travels 260 km by train and 240 km by taxi, he takes 6 minutes longer. Find the speed of the train and that of the taxi.
13. A leading library has a fixed charge for the first three days and an additional charge for each day thereafter Sarika paid ₹27 for a book kept for seven days, while Sury paid ₹ 21 for the book she kept for five days, find the fixed charge and the charge for each extra day.
14. When 3 is added to the denominator and 2 is subtracted from the numerator a fraction becomes $\frac{1}{4}$. When 6 is added to numerator and denominator is multiplied by 3, fraction becomes $\frac{2}{3}$. Find the fraction.
15. Determine graphically whether the following pair of linear equations:
 $3x - y = 7$
 $2x + 5y + 1 = 0$ has:
- a unique solution
 - infinitely many solutions or
 - no solution.

16. Show graphically that the system of equations $3x - y = 2$
 $9x - 3y = 6$
 has infinitely many solutions.
17. The area of a rectangle gets reduced by 9 square units, if its length is reduced by 5 units and the breadth is increased by 3 units. The area is increased by 67 square units if length is increased by 3 units and breadth is increased by 2 units. Find the perimeter of the rectangle.
18. Romila went to a stationary stall and purchased 2 pencils and 3 erasers for Rs.9. Her friend Sonali saw the new variety of pencils and erasers with Romila, and she also bought 4 pencils and 6 erasers of the same kind for Rs.18. Represent this situation algebraically and graphically.
19. 37 pens and 53 pencils together cost ₹320, while 53 pens and 37 pencils together cost ₹400. Find the cost of a pen and that of a pencil.
20. Solve the following system of equation by elimination method $5x + 3y = 70$; $3x - 7y = 60$.
21. The ratio of incomes of two persons is 11 : 7 and the ratio of their expenditures is 9 : 5. If each of them manages to save Rs 400 per month, find their monthly incomes.
22. In a $\triangle ABC$, $\angle C = 3\angle B = 2(\angle A + \angle B)$. Find the three angles.
23. The sum of digits of a two digit number is 13. If the number is subtracted from the one obtained by interchanging the digits, the result is 45. What is the number?
24. If we add 1 to the numerator of a fraction, it reduces to $\frac{1}{2}$. If we subtract 1 from the denominator, it reduces to $\frac{1}{3}$.
 Represents This situation algebraically and graphically.
25. Form the pair of linear equations in the problem, and find its solution (if it exists) by the elimination method:
 A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Mona paid Rs.27 for a book kept for seven days, while Tanvy paid Rs.21 for the book she kept for five days. Find the fixed charge and the charge for each extra day.
26. Half the perimeter of a rectangular garden, whose length is 4 m more than its width, is 36 m. find the dimensions of the garden.
27. A takes 3 hours more than B to walk a distance of 30 km. but, if a double his pace (speed) he is ahead of B by $1\frac{1}{2}$ hours, find their speed of walking.
28. Solve the following pair of linear equations by the elimination method and the substitution method: $x + y = 5$ and $2x - 3y = 4$
29. Ten years ago, father was twelve times as old as his son and ten years hence, he will be twice as old as his son will be. Find their present ages.
30. Form the pair of linear equations in the problem, and find its solution graphically.
 10 students of class X took part in Mathematics quiz. If the number of girls is 4 more than the number of boys, find the number of boys and girls who took part in the quiz.
31. A passenger train takes one hour less for a journey of 150 km if its speed is increased by 5 km/hr from its usual speed. Find the usual speed of the train.
32. A man bought a certain number of toys for Rs.180, he kept one for his own use and sold the rest for one rupee each more than he gave for them, besides getting his own toy for nothing he made a profit of Rs.10. Find the number of toys.
33. If a, b, c are real numbers such that $ac \neq 0$, then show that at least one of the equations $ax^2 + bx + c = 0$ and $-ax^2 + bx + c = 0$ has real roots.

34. Two trains leave a railway station at the same time. The first train travels due west and the second train due north. The first train travels 5 km/hr faster than the second train. If after two hours, they are 50 km apart, find the average speed of each train.
35. The perimeter of right-angled triangle is five times the length of its shortest side. The numerical value of the area of the triangle is 15 times the numerical value of the length of the shortest side. Find the lengths of the three sides of the triangle.
36. The age of a man is twice the square of the age of his son. Eight years hence, the age of the man will be 4 years more than three times the age of his son. Find their present ages.
37. A bus travels at a certain average speed for a distance of 75 km and then travels a distance of 90 km at an average speed of 10 km/hr more than the first speed. If it takes 3 hours to complete the total journey, find its original speed.
38. In a flight of 2800 km, an aircraft was slowed down due to bad weather. Its average speed is reduced by 100 km/hr and time of flight increased by 30 minutes. Find the original duration of the flight.
39. The angry Arjun carried some arrows for fighting with Bheeshm. With half the arrows, he cut down the arrows thrown by Bheeshm on him and with six other arrows he killed the rath driver of Bheeshm. With one arrow each, he knocked down respectively the rath, flag and the bow of Bheeshm. Finally, with one more than four times the square root of arrows he laid Bheeshm unconscious on an arrow bed. Find the total number of arrows Arjun had.
40. While boarding an aeroplane, a passenger got hurt. The pilot showing promptness and concern, made arrangements to hospitalize the injured and so the plane started late by 30 minutes to reach the destination. 1500 km away in time, the pilot increased the speed by 100 km/hr. Find the original speed /hour of the plane.
41. If α and β are the zeroes of the polynomial $x^2 + 4x + 3$, find the polynomial whose zeroes are $1 + \frac{\beta}{\alpha}$ and $1 + \frac{\alpha}{\beta}$.
42. If two zeroes of the polynomial $p(x) = x^4 - 6x^3 - 26x^2 + 138x - 35$ are $2 \pm \sqrt{3}$. Find the other zeroes.
43. Find the zeros of $f(v) = v^2 + 4\sqrt{3}v - 15$ and verify the relationship between the zeros and its coefficients.
44. Find the zeros of $q(y) = 7y^2 - \frac{11}{3}y - \frac{2}{3}$ and verify the relationship between the zeros and its coefficients.
45. If the two zeroes of the polynomial $x^4 - 6x^3 - 26x^2 + 138x - 35$ are $2 \pm \sqrt{3}$, find other zeroes.
46. Find the zeros of $f(s) = 2s^2 - (1 + 2\sqrt{2})s + \sqrt{2}$ and verify the relationship between the zeros and its coefficients.
47. If α and β are the zeroes of the polynomial $p(x) = 6x^2 + 5x - k$ satisfying the relation, $\alpha - \beta = \frac{1}{6}$, then find the value of k.
48. If α and β are the zeroes of polynomial $p(x) = 3x^2 + 2x + 1$, find the polynomial whose zeroes are $\frac{1-\alpha}{1+\alpha}$ and $\frac{1-\beta}{1+\beta}$.

49. Verify that the numbers $\frac{1}{2}$, 1 , $-\frac{3}{2}$ are the zeroes of the cubic polynomial $2x^3 + x^2 - 5x + 2$. Also, verify the relationship between the zeroes and its coefficients.

50. If β and $\frac{1}{\beta}$ are zeroes of the polynomial $(\alpha^2 + \alpha)x^2 + 61x + 6\alpha$. Find the values of β and α .