

**DELHI PUBLIC SCHOOLJAMMU
SESSION-2021-2022**

HOLIDAY HOMEWORK

**CLASS: X
SUBJECT: MATHEMATICS**



ACTIVITY :

To find the height of a building using a clinometer.

REAL NUMBERS- CASE STUDY

CASE STUDY 1.

To enhance the reading skills of grade X students, the school nominates you and two of your friends to set up a class library. There are two sections- section A and section B of grade X. There are 32 students in section A and 36 students in section B.



1. What is the minimum number of books you will acquire for the class library, so that they can be distributed equally among students of Section A or Section B?

- a) 144
- b) 128
- c) 288
- d) 272

2. If the product of two positive integers is equal to the product of their HCF and LCM is true then, the HCF (32, 36) is

- a) 2
- b) 4
- c) 6
- d) 8

3. 36 can be expressed as a product of its primes as

- a) $2^2 \times 3^2$
- b) $2^1 \times 3^3$

c) $2^3 \times 3^1$

d) $2^0 \times 3^0$

4. 7 is a

- a) Prime number
- b) Composite number
- c) Neither prime nor composite
- d) None of the above

5. If p and q are positive integers such that $p = a$ and $q = b$, where a, b are prime numbers, then the LCM(p, q) is

- a) ab
- b) a^3b^3
- c) a^2b^3
- d) a^3b^2

CASE STUDY 2:

A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.



1. In each room the same number of participants are to be seated and all of them being in the same subject, hence maximum number participants that can accommodated in each room are

- a) 14
- b) 12

- c) 16
- d) 18

2. What is the minimum number of rooms required during the event?

- a) 11
- b) 31
- c) 41
- d) 21

3. The LCM of 60, 84 and 108 is

- a) 3780
- b) 3680
- c) 4780
- d) 4680

4. The product of HCF and LCM of 60,84 and 108 is

- a) 55360
- b) 35360
- c) 45500
- d) 45360

5. 108 can be expressed as a product of its primes as

- a) $2^3 \times 3^2$
- b) $2^3 \times 3^3$
- c) $2^2 \times 3^2$
- d) $2^2 \times 3^2$

POLYNOMIALS- CASE STUDY

CASE STUDY 1:

The below given picture are few natural examples of parabolic shape which is represented by a quadratic polynomial. A parabolic arch is an arch in the shape of a parabola. In structures, their curve represents an efficient method of load, and so can be found in bridges and in architecture in a variety of forms.



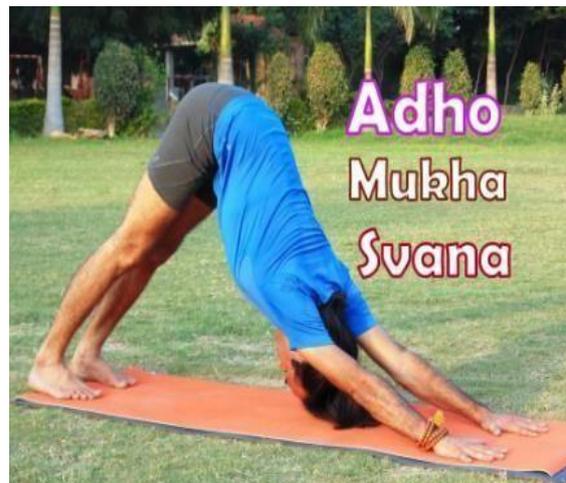
1. In the standard form of quadratic polynomial, a , b and c are
 - a) All are real numbers.
 - b) All are rational numbers.
 - c) ' a ' is a 'non zero' real number and b and c are any real numbers.
 - d) All are integers.
2. If the roots of the quadratic polynomial are equal, where the discriminant $D = b^2 - 4ac$, then
 - a) $D > 0$
 - b) $D < 0$
 - c) $0 \leq D$
 - d) $D = 0$
3. If α and β are the zeroes of the quadratic polynomial $2x^2 - x + 8k$ then k is
 - a) 4
 - b) $\frac{1}{4}$
 - c) $-\frac{1}{4}$
 - d) 2
4. The graph of $x^2 + 1 = 0$
 - a) Intersects x - axis at two distinct points.
 - b) Touches x -axis at a point.
 - c) Neither touches nor intersects x -axis.
 - d) Either touches or intersects x - axis.

5. If the sum of the roots is $-p$ and product of the roots is $-1/p$, then the quadratic polynomial is

- a) $k(-px^2+x/p+1)$
- b) $k(x^2+px-1/p)$
- c) $k(x^3+px-1/p)$
- e) $k(x^2+px+1/p)$

CASE STUDY 2:

An asana is a body posture, originally and still a general term for a sitting meditation pose, and later extended in hatha yoga and modern yoga as exercise, to any type of pose or position, adding reclining, standing, inverted, twisting, and balancing poses. In the figure, one can observe that poses can be related to representation of quadratic polynomial.



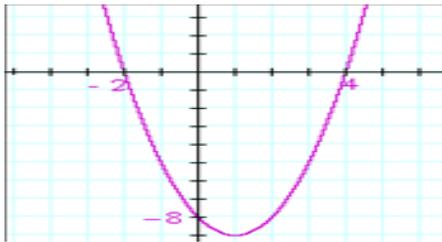
1. The shape of the poses shown is

- a) Spiral
- b) Ellipse
- c) Linear
- d) Parabola

2. The graph of parabola opens downwards, if _____

- a) $a \geq 0$
- b) $a = 0$
- c) $a < 0$
- d) $a > 0$

3. In the graph, how many zeroes are there for the polynomial?



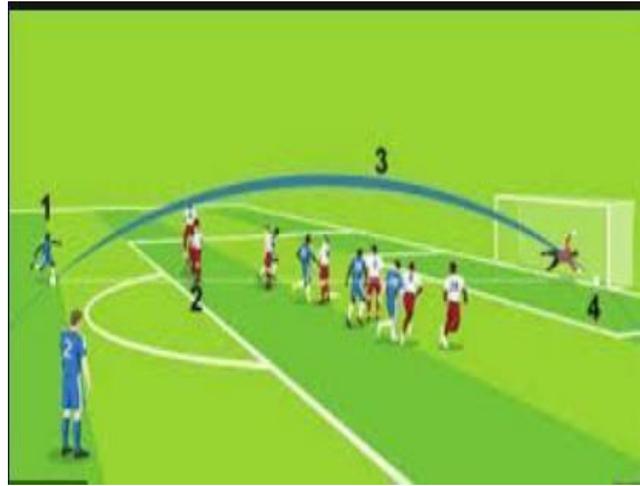
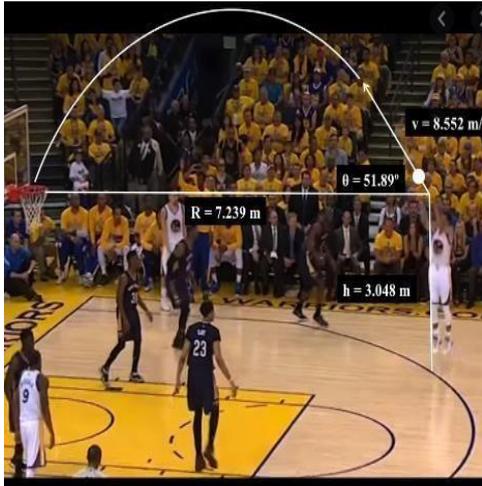
- a) 0
- b) 1
- c) 2
- d) 3

4. The two zeroes in the above shown graph are

- a) 2,4
- b) -2, 4
- c) -8, 4
- d) 2,-8

CASE STUDY 3:

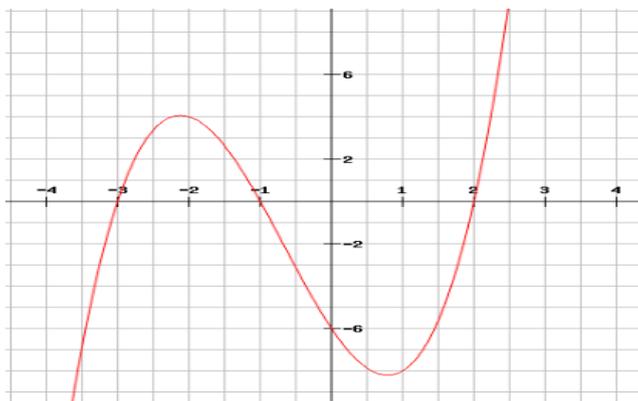
Basketball and soccer are played with a spherical ball. Even though an athlete dribbles the ball in both sports, a basketball player uses his hands and a soccer player uses his feet. Usually, soccer is played outdoors on a large field and basketball is played indoor on a court made out of wood. The projectile (path traced) of soccer ball and basketball are in the form of parabola representing quadratic polynomial.



1. The shape of the path traced shown is
 - a) Spiral
 - b) Ellipse
 - c) Linear
 - d) Parabola

2. The graph of parabola opens upwards, if _____
 - a) $a = 0$
 - b) $a < 0$
 - c) $a > 0$
 - d) $a \leq 0$

3. Observe the following graph and answer



In the above graph, how many zeroes are there for the polynomial?

- a) 0
- b) 1

c) 2

d) 3

4. The three zeroes in the above

shown graph are

a) 2, 3, -1

b) -2, 3, 1

c) -3, -1, 2

d) -2, -3, -1

LINEAR EQUATIONS INTWO VARIABLES

CASE STUDY-1:

A test consists of 'True' or 'False' questions. One mark is awarded for every correct answer while $\frac{1}{4}$ mark is deducted for every wrong answer.

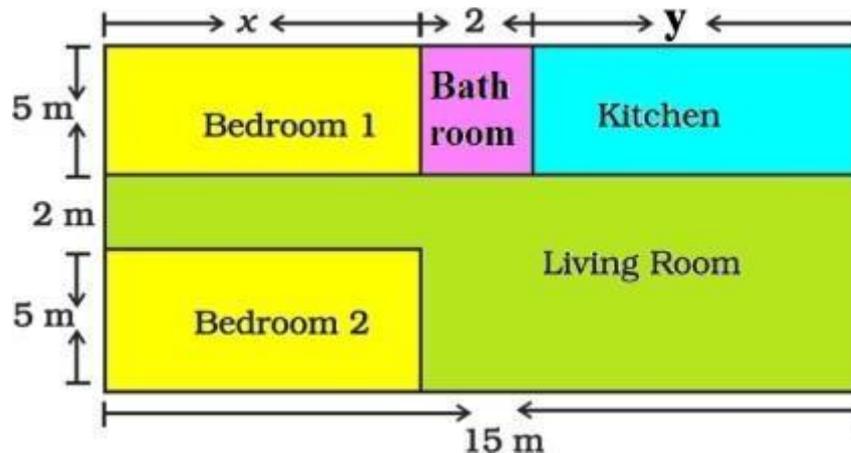
A student knew answers to some of the questions. Rest of the questions he attempted by guessing. He answered 120 questions and got 90 marks.

Type of Question	Marks given for correct answer	Marks deducted for wrong answer
True/False	1	0.25

1. If answer to all questions he attempted by guessing were wrong, then how many questions did he answer correctly?
2. How many questions did he guess?
3. If answer to all questions he attempted by guessing were wrong and answered 80 correctly, then how many marks he got?
4. If answer to all questions he attempted by guessing were wrong, then how many he questions answered correctly to score 95 marks?

CASE STUDY-2:

Amit is planning to buy a house and the layout is given below. The design and the measurement have been made such that areas of two bedrooms and kitchen together are 95 sq.m.



Based on the above information, answer the following questions:

1. Form the pair of linear equations in two variables from this situation.
2. Find the length of the outer boundary of the layout.
3. Find the area of each bedroom and kitchen in the layout.
4. Find the area of living room in the layout.
5. Find the cost of laying tiles in kitchen at the rate of Rs. 50 per sq.m.

NOTE:

1. Send your Holiday Homework by e-mail to your respective Subject Teacher by 13th of July, 2021. Your submission will carry 4 marks.
(2 marks- Subject Relevance & Research, 2 marks- Handwriting).
2. Practice for your Homework/ Project Presentation (5-6mins) to be held during virtual class after holidays. It will carry 6 marks.
(2 marks- Confidence, 2 marks- Subject Clarity, 2 marks- Presentation Skills).
3. The schedule for presentation will be shared later.
4. The teacher may ask 1 or 2 questions during the presentation

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