CLASS 10 MATHEMATICS: FULL-SYLLABUS HIGH-YIELD WORKSHEET----------
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CHAPTER 1: REAL NUMBERS

[QUESTION 1]

Prove that $3 + 2\sqrt{5}$ is an irrational number, given that $\sqrt{5}$ is an irrational number.

[QUESTION 2]

Find the HCF and LCM of 26 and 91 using the prime factorization method. Verify that

HCF × LCM = Product of the two numbers.

CHAPTER 2: POLYNOMIALS

[QUESTION 3]

Find the zeroes of the quadratic polynomial $f(x) = 6x^2 - 3 - 7x$ and verify the relationship

between the zeroes and its coefficients.

[QUESTION 4]

If α and β are the zeroes of the quadratic polynomial $p(x) = x^2 - 5x + k$ such that $\alpha - \beta = 1$,

calculate the value of k.

CHAPTER 3: PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

[QUESTION 5]

For which value of k will the following pair of linear equations have infinitely many solutions?

$kx + 3y - (k - 3) = 0$

$12x + ky - k = 0$

[QUESTION 6]

Solve the following pair of linear equations graphically or algebraically:

$2x + 3y = 11$

$2x - 4y = -24$

Hence, find the value of 'm' for which $y = mx + 3$.

CHAPTER 4: QUADRATIC EQUATIONS

[QUESTION 7]

Find the value of p for which the quadratic equation $px(x - 2) + 6 = 0$ has two equal real roots.

[QUESTION 8]

A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than

to return downstream to the same spot. Find the speed of the stream.

CHAPTER 5: ARITHMETIC PROGRESSIONS

[QUESTION 9]

The 4th and 8th terms of an AP are 24 and 44 respectively. Find the sum of the first 10 terms of

this arithmetic progression.

[QUESTION 10]

If the sum of the first n terms of an AP is given by $S_n = 3n^2 + 5n$, find the nth term of this AP.

Hence, state its 15th term.

CHAPTER 6: TRIANGLES

[QUESTION 11]

In a triangle ABC, D and E are points on the sides AB and AC respectively such that DE || BC.

If AD = x, DB = x - 2, AE = x + 2, and EC = x - 1, find the value of x.

[QUESTION 12]

Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides

in distinct points, the other two sides are divided in the same ratio (Basic Proportionality Theorem).

CHAPTER 7: COORDINATE GEOMETRY

[QUESTION 13]

Find the coordinates of the point which divides the line segment joining the points (4, -3) and

(8, 5) in the ratio 3 : 1 internally.

[QUESTION 14]

Find a relation between x and y such that the point P(x, y) is equidistant from the points

A(7, 1) and B(3, 5).

CHAPTER 8: INTRODUCTION TO TRIGONOMETRY

[QUESTION 15]

If sin(A - B) = 1/2 and cos(A + B) = 1/2, where $0° < A + B \leq 90°$ and A > B, find the values of

the angles A and B.

[QUESTION 16]

Prove the following trigonometric identity:

$(\sin \theta - 2\sin^3 \theta) / (2\cos^3 \theta - \cos \theta) = \tan \theta$

CHAPTER 9: SOME APPLICATIONS OF TRIGONOMETRY

[QUESTION 17]

As observed from the top of a 75 m high lighthouse from the sea-level, the angles of depression of

two ships are 30° and 45°. If one ship is exactly behind the other on the same side of the

lighthouse, find the distance between the two ships.

[QUESTION 18]

A 1.2 m tall girl spots a balloon moving with the wind in a horizontal line at a height of 88.2 m

from the ground. The angle of elevation of the balloon from the eyes of the girl at any instant

is 60°. After some time, the angle of elevation reduces to 30°. Find the distance traveled by

the balloon during this interval.

CHAPTER 10: CIRCLES

[QUESTION 19]

Prove that the lengths of tangents drawn from an external point to a circle are equal.

[QUESTION 20]

A quadrilateral ABCD is drawn to circumscribe a circle. Prove that AB + CD = AD + BC.

CHAPTER 11: AREAS RELATED TO CIRCLES / SURFACE AREAS AND VOLUMES

[QUESTION 21]

A solid is in the shape of a cone standing on a hemisphere with both their radii being equal to

1 cm and the height of the cone is equal to its radius. Find the volume of the solid in terms of π.

[QUESTION 22]

A tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of

the cylindrical part are 2.1 m and 4 m respectively, and the slant height of the top is 2.8 m,

find the area of the canvas used for making the tent.

CHAPTER 12: STATISTICS

[QUESTION 23]

The distribution below shows the marks obtained by students in a test. If the median of the

distribution is 28.5, find the missing values of frequencies x and y, given the total frequency is 60.

| Marks | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 |

| Frequency | 5 | x | 20 | 15 | y | 5 |

[QUESTION 24]

Find the mode of the following distribution data representing the lifetime (in hours) of

electrical components:

| Lifetime (hr) | 0-20 | 20-40 | 40-60 | 60-80 | 80-100 | 100-120 |

| Frequency | 10 | 35 | 52 | 61 | 38 | 29 |

CHAPTER 13: PROBABILITY

[QUESTION 25]

One card is drawn from a well-shuffled deck of 52 playing cards. Find the probability of getting:

(i) A king of red color.

(ii) A face card.

(iii) A red face card.

[QUESTION 26]

A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from

the box, find the probability that it bears:

(i) A two-digit number.

(ii) A perfect square number.

(iii) A number divisible by 5.

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