SIDHESHWAR
PUBLIC SCHOOL
Learning Breeds Courtesy

CLASS XI MATHEMATICS HOLIDAYS HOMEWORK

SESSION 2026-27

Instructions:

Make one model on any one of the following topics:

1. Linear Inequalities
2. Trigonometry
3. Complex numbers

Weightage in internal assessment will be given

Name: _____

Class/Section: _____

Name of Subject In charge: _____

SH. S. N. SIDHESHWAR SR. SEC. PUBLIC SCHOOL

CLASS: XI

SUBJECT: MATHEMATICS

2026-27

ASSIGNMENT 2: LINEAR INEQUALITIES

1. Solve the following system of Inequalities:

(i) $4x + 3 \geq 2x + 17$, $3x - 5 < -2$

(ii) $\frac{x}{4} - \frac{2x}{3} \leq 1\frac{5}{8}$, $15 - 7x > 2x - 27$

2. Solve $\frac{2x + 4}{2} + 2(3 - x) \geq 7$, $x \in R$. Also graph the solution set on the number line.

3. The longest side of a triangle is twice the shortest side and the third side is 2cm longer than the shortest side. If the perimeter of the triangle is more than 166cm, then find the minimum length of the shortest side.

4. Find all pairs of consecutive odd positive integers, both of which are larger than 10 such that their sum is less than 40.

5. A manufacturer has 600 litres of 12% solution of acid. How many litres of 30% acid solution must be added to it so that acid content in the resulting mixture will be more than 15% and less than 18%.

6. Find all pairs of consecutive odd positive integers, both of which are larger than 10 such that their sum is less than 40.

7. A solution is to be kept between 40°C and 45°C. What is the range of temperature in degree Fahrenheit, if the conversion formula is $F = \frac{9}{5}C + 32$?

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ASSIGNMENT 3: TRIGONOMETRY

1. Convert ***5° 37′ 30″*** into radian measure.

2. Convert $\frac{13\pi}{4}$ into degree measure.

3. Find the degree measure of the angle subtended at the centre of a circle of diameter ***200cm*** by an arc of length ***22cm***.

4. Large hand of a clock is ***21cm*** long. How much distance does its extremity move in ***20 minutes***.

5. Find the value of the following:

(i) $\sin \frac{19\pi}{4}$ (ii) $\tan 330°$ (iii) $\sin 225°$

6. Prove that:

$$\cos x + \sin\left(\frac{3\pi}{2} + x\right) - \sin\left(\frac{3\pi}{2} - x\right) + \cos(\pi + x) = 0$$

7. If α, β lie in first quadrant and $\sin\alpha = \frac{8}{17}$, $\tan\beta = \frac{5}{12}$, Find the value of $\cos(\alpha - \beta)$ and $\tan(\alpha - \beta)$.

8. Evaluate the following:

(i) $\sin^2\frac{\pi}{4} + \sin^2\frac{3\pi}{4} + \sin^2\frac{5\pi}{4} + \sin^2\frac{7\pi}{4}$

(ii) $\sin^2\frac{\pi}{8} + \sin^2\frac{3\pi}{8} + \sin^2\frac{5\pi}{8} + \sin^2\frac{7\pi}{8}$

9. Simplify the following:

$$\frac{\cos x}{\sin\left(\frac{\pi}{2} + x\right)} + \frac{\sin(-x)}{\sin(\pi + x)} - \frac{\tan\left(\frac{\pi}{2} + x\right)}{\cot x}$$

10. Prove that: $\tan 56° = \dfrac{\cos 11° + \sin 11°}{\cos 11° - \sin 11°}$

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ASSIGNMENT 1

COMPLEX NUMBERS

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1. Reduce $\frac{1}{1-4i} - \frac{2}{1+i}$ in the form $a+ib$.

2. What is the modulus of the complex number $4-3i$?

3. Find the modulus of $\frac{1+i}{1-i} - \frac{1-i}{1+i}$.

4. Find the real and imaginary part of $\frac{1+i}{1-i}$.

5. Express $\frac{1+7i}{(2-i)^2}$ in the form $a+ib$.

6. Show that:

(i) $i^{12} + i^{13} + i^{14} + i^{15} = 0$

(ii) $1 + i^{22} + i^{30} + i^{62}$ is a real number.

7. If $a+ib = \frac{(x+i)^2}{3x-i}$, Prove that $a^2+b^2 = \frac{(x^2+1)^2}{9x^2+1}$.

8. What is the modulus of the complex number $\frac{(1+2i)(3-4i)}{(4-3i)(2+3i)}$?

9. If $\frac{(1+i)^2}{2-i} = x+iy$, Find the value of x and y.

10. If $x+iy = \sqrt{\frac{1+i}{1-i}}$, Prove that $x^2+y^2=1$.

11. Find the multiplicative inverse of $3-5i$.

12. If α and β are different complex numbers with $|\beta|=1$, then find $\left| \frac{\beta-\alpha}{1-\alpha\beta} \right|$.