

Pre-Calculus Summer Work

1. Simplify the expression $(3 - 3i)^3$ by performing operations with pure imaginary numbers and complex numbers.
2. Simplify i^2 .
3. Simplify i^{13} .
4. Simplify the expression: $(7 + 5i) + (2 - 12i)$.
5. Simplify the expression: $(7 + 9i)(8 - 10i)$.
6. Simplify the expression: $(-2 + 6i)(-11 - 3i)$.
7. $\frac{7}{7 + 5i}$
8. $\frac{9 - 19i}{12 - 5i}$
9. Graph $f(x) = x^2 + 2x + 3$ by making a table of values.
10. Consider the quadratic function $f(x) = -2x^2 + 4x + 2$. Find the y -intercept and the equation of the axis of symmetry.
11. Consider $f(x) = -4x^2 + 24x + 3$. Determine whether the function has a maximum or minimum value. Then find the value of the maximum or minimum.
12. Solve the equation $x^2 - 13x + 40 = 0$.
13. Solve $x^2 + 4x + 3 = 0$ by completing the square.
14. Find the exact solution of $-x^2 + 3x + 7 = 0$ by using the Quadratic Formula.
15. Simplify the expression: $\sqrt{16a^{10}}$
16. Simplify the expression: $\sqrt{36a^4}$
17. Simplify $\sqrt[4]{81a^{32}b^{20}}$.
18. Simplify the expression. $\frac{x^{\frac{4}{7}} \cdot x^{\frac{3}{7}}}{x^{\frac{1}{7}}}$

Pre-Calculus Summer Work

19. Simplify the expression. $\frac{x^{\frac{7}{2}} \cdot x^{\frac{3}{2}}}{x^{\frac{1}{2}}}$

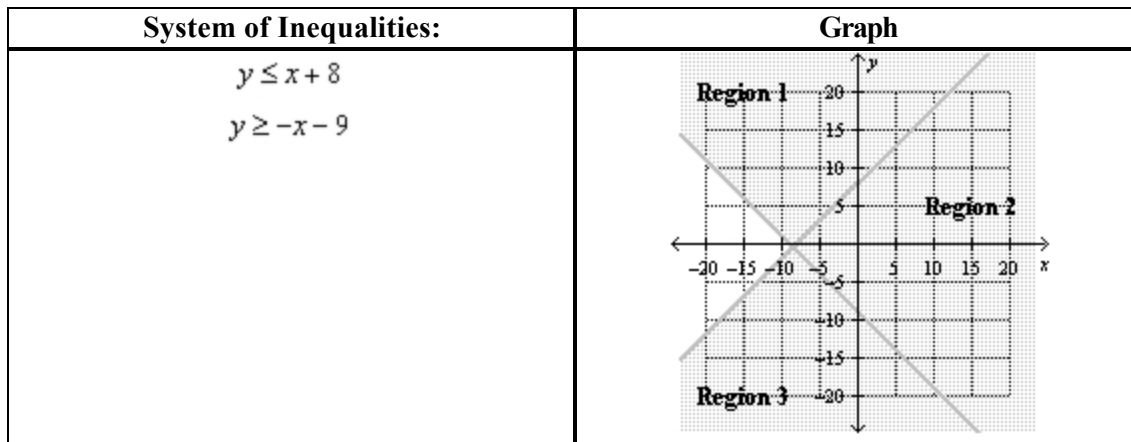
20. Solve the system of equations algebraically.

$$\begin{aligned} 4x - 4y &= -48 \\ 5x - 6y &= -65 \end{aligned}$$

21. Solve the system of equations by using substitution.

$$\begin{aligned} -3x - 5y &= -21 \\ -7x - 7y &= -35 \end{aligned}$$

22. Which region in the graph below is the solution of the system of inequalities given below?



23. Solve the system of inequalities by graphing.

$$\begin{aligned} y &\leq -7x - 2 \\ y &\geq 9x + 7 \end{aligned}$$

24. Find $\begin{bmatrix} 6 \\ -1 \\ 8 \end{bmatrix} + \begin{bmatrix} -5 \\ -6 \\ 9 \end{bmatrix}$.

25. Find $\begin{bmatrix} 2 & 1 \\ -1 & -3 \end{bmatrix} - \begin{bmatrix} 0 & 2 \\ -2 & -6 \end{bmatrix}$.

Pre-Calculus Summer Work

26. Find $\begin{bmatrix} 6 & 8 \\ -3 & -8 \end{bmatrix} + \frac{1}{2} \begin{bmatrix} 0 & 4 \\ -8 & -10 \end{bmatrix}$.

27. If $A = \begin{bmatrix} -3 & 7 & -5 \\ 3 & 7 & 9 \end{bmatrix}$, find $-4A$.

28. If $A = \begin{bmatrix} 5 & 8 & 1 \\ 5 & -4 & 3 \\ 9 & 3 & -4 \end{bmatrix}$ and $B = \begin{bmatrix} 9 & 2 & -3 \\ 3 & -2 & 2 \\ 4 & 2 & 8 \end{bmatrix}$, find $A + B$.

29. A bookstore offers a collection of books. A student can select from one of 6 algebra books, one of 4 geometry books, and one of 5 calculus books. How many different possibilities are available for that collection?

30. Find the range of the data shown on the box-and-whisker plot below.



Jeffery surveyed 50 randomly selected workers at a factory. He collected data about the individual output of a worker on an average day. The results are shown using the box-and-whisker plot.



31. What is the interquartile range of the box-and-whisker plot shown?

Let $U = \{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$, $M = \{-4, -2, 0\}$, $N = \{-4, -3, -2, 3, 5\}$, $P = \{-5, -1, 2, 4, 5\}$, and $Q = \{2, 5\}$.

32. State whether $M \subseteq N$ is *true* or *false*.

33. Solve the equation $x^2 - 10x + 22 = 0$.

34. Solve the system of equations.

$$\begin{aligned} -2x + 7y + z &= 38 \\ 2x + 3y + 4z &= 17 \\ 6x - y - 7z &= 94 \end{aligned}$$

Name: _____ Class: _____ Date: _____

Pre-Calculus Summer Work

The marks of 25 students are listed below.

18, 17, 3, 6, 25, 25, 21, 37, 36, 35, 17, 18, 4, 32, 37, 43, 48, 46, 32, 17, 25, 37, 48, 12, 25

35. Make a cumulative frequency distribution for the data. Then determine the cumulative relative frequency distribution.