NAME:_____**St. Dominic Academy**

ALGEBRA 2 Summer Packets 2024

INSTRUCTIONS: Welcome ! to your Algebra 2 Honors Summer work packet ! Completing these practice questions is crucial to ensure a smooth transition into Algebra 2 Honors next school year. By dedicating time to these problems. You are setting yourself up for success and building a strong foundation in Algebra. This work packet is due on September 9 , 2024. It should be given to me (Mr. Tubera) in a hard copy. Here are some suggestion to achieve the best performance to this work.

1) **Work on few questions each day to prevent overwhelming yourself.**
2) **Show your work to review your steps and identify any areas of improvement.**
3) **Utilize textbooks, online resources and peers for additional help when needed.**
4) **Check your answers among your peers or any solution available. "Good Mathematician Always check their work".**

The benefits of completing the packet:

1) **Enhanced understanding of algebraic concepts**
2) **Improved problem-solving skills**
3) **Confidence in talking complex algebraic problems**
4) **Higher readiness for the testing that awaits you at the beginning of the school year.**

A. Match the vocabulary term in column on the left with the most specific description in the column on the right. By writing the letter that corresponds to the words or group of words being describe. (2 points each)

1) _____polynomial 2) _____degree 3) _____standard form of a polynomial 4) _____degree of polynomial 5) _____$\sqrt{-1}$ 6) _____vertex 7) _____ $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$	A. The terms in the polynomial wherein the degree is in the descending order. B. The value of i ,called the imaginary number. C. Quadratic formula D. is a monomial or the sum of monomials. E. The highest or lowest point of a parabola. F. Is the largest degree of any term of the polynomial. G. The exponent of the variable in a term.

8) _____relation 9) _____domain 10) _____vertical – line Test 11) _____range 12) _____function rule 13) _____function notation 14) _____dependent variable	H. is the set of the second coordinates I. a test to determine whether a relation is a function or not by passing a vertical line. J. Is an equation that describes a function. You can think of it as an **Input-Output** machine. K. When use $f(x)$ to indicate outputs L. is the first coordinates of the ordered pairs. M. is a set of ordered pairs. N. Is a variable that depends on the value of the variable x.

B. Find the value of x (3 points each)

1) $2x + 3x = 10$

2) $3(x + 1) = 6$

3) $2^x = 8$

4) $2^{2x+1}\ 16$

5) $9^{3x} = 27$

C. Solve each quadratic equation. Formula. $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$ **(5 Points each)**

1) $x^2 + 10x + 25 = 0$

2) $x^2 + 8x - 9 = 0$

3) $3x^2 - 5x - 2 = 0$

D. Complete the table below. Classify a polynomial below by the number of terms it contains. Name using the degree and the number of terms. (2 Points)

Degree	Name using Degree	Polynomial Example	Number of Terms	Name Using Number of Terms
		6		
		$x + 3$		
		$3x^2$		
		$2x^3 - 5x^2 - 2x$		
		$x^4 + 3x^2$		
		$-2x^5 + 3x^2 - x + 4$		

E. Multiply the following and name the polynomials. (5 points each)

1) $(x + 3)(x - 9)$

2) $(x - 2)(x + 3)(x - 5)$

3) $(x+3)^2(x-2)$

F. Divide the following using Long Division. (5 points each)

1) $x^2+3x-12$ **by** $x-3$

2) $(3x^3+17x^2+21x-9) \div (x+3)$

G. Divide the following using Synthetic Division. (5 points each)

1) $(x^4 - 2x^3 + x^2 + x - 1) \div (x - 1)$

2) $(x^4 - \frac{9}{2}x^3 + 3x^2 - \frac{1}{2}x) \div (x - \frac{1}{2})$

H. **Solve the following polynomial equation.** Leave your answer in exact form. (5 points each)

1) $x^3 - 8 = 0$

2) $x^4 - 2x^2 - 8 = 0$

I. **MULTIPLE CHOICE. SAT Format.** Write the letter that corresponds to the correct answer in the space provided for**. (2 points each)**

1) _____**What is the remainder when $x^2 - 5x + 7$ is divided by $x + 1$?**
   a) **-13**
   b) **-1**
   c) **1**
   d) **13**

2) _____**Which binomial is NOT a factor of $x^3 - x^2 - 17x - 15$?**
   a) $x - 5$
   b) $x + 1$
   c) $x + 3$
   d) $x + 5$

3) _____**Which of the following, when multiplied by $x - 1$, results in a cubic polynomial whose standard form has three terms?**
   a) $(x - 1)^2$
   b) $x^2 - x$
   c) $x^2 - 1$
   d) $x - 1$

4) _____**Which expression is a factor of $x^4 - 18x^2 + 81$?**
   a) $x^2 - 9$
   b) $x^2 + 6x - 9$
   c) $x^2 - 6x - 9$
   d) $x^2 + 9$

5) _____**Which value is NOT a solution of $x^4 - 3x^2 - 54 = 0$?**
   a) **-3**
   b) **3**
   c) $-3i$
   d) $-i\sqrt{6}$

J. Solve the following equations.

1) $3\sqrt{2x} - 3 = 9$

2) $(x - 9)^{\frac{1}{2}} + 1 = x^{\frac{1}{2}}$

K. TYPE ll. Essay. Reflect on your completion of the Algebra 2 honors summer work packet. .Discuss the challenges you encountered, how you overcame them, and the impact this preparation had on your grasp of Algebra. Explain how this work had boosted your problem-solving confidence and outline how you aim to utilize these newfound skills in Algebra 2 Honors.(10 points).

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x_____.

I certify that this is my honest work. _____(signature)