

Summer Work- Precalculus

A quick note from your Precalculus Teacher;

Entering Precalculus means entering your first year of college preparatory mathematics. There is a major shift in expectation for students to be able to recall many skills at a moment's notice. Certain concepts that have been taught to you over the previous years are assumed to be mastered. If you do not have these skills, you will find that you will consistently get problems incorrect next year as you make mistakes. It is frustrating for students who spend much of their class and homework time relearning algebra concepts while learning how to tie these concepts to new material. This summer packet is intended for you to brush up and possibly relearn these topics.

You are expected to complete all these problems before the beginning of class next year and show any/all work used to arrive at your answer. **ONLY RECORD YOUR ANSWERS WITHIN THIS SUMMER PACKET! YOU MUST SUBMIT YOUR WORK FOR EACH PROBLEM ON A SEPARATE SHEET OF PAPER FOR FULL CREDIT!**

You will be graded on your completion of this packet and the organization of the work provided. The assignment will be graded as a **FORMATIVE**. (Remember no work no credit.) To support you in completing this assignment with a high degree of accuracy, you will find a different assortment of resources (videos) that you can work through to help you demonstrate subject mastery.

I have provided a checklist below to help you complete the work in a timely and manageable manner. I expect that you will need a few weeks off to relax before even beginning to do schoolwork which is why your check list doesn't start until July 14th. I am expecting you to complete between 10-15 problems each week with the last week being your final week to relax. **DON'T WAIT UNTIL THE LAST WEEK OF SUMMER TO COMPLETE THIS PACKET.**

Have a wonderful summer and I am looking forward to seeing you in August.

Mr. Sermon

Summer Work Checklist						
Week of July 14 th	Topic 0: Summer Work Requirements Topic 1 (Prt 1): Adding and Subtracting Fractions	Finish By 07/18	Completed: ☐	Topic 1 (Prt 2): Multiplying and Dividing Fractions	Finish By 07/21	Completed: ☐
Week of July 21 st	Topic 2: Properties of Exponents	Finish by 07/25	Completed: ☐	Topic 3: Simplifying Square roots	Finish by 07/28	Completed: ☐
Week of July 28 th	Topic 4: Function Notation	Finish by 08/01	Completed: ☐	Topic 5: Linear Inequalities	Finish by 08/04	Completed: ☐
Week of August 4 th	Topic 6: Multiplying Polynomials	Finish by 08/08	Completed: ☐	Topic 7: Factoring GCF	Finish By 08/11	Completed: ☐
Week of August 11 th	Topic 8: Factoring Trinomials Part 1	Finish by 08/15	Completed: ☐	Topic 9 Factoring Trinomials Part 2	Finish by 08/18	Completed: ☐
Week of August 18	Topic 10: Solving Quadratic Equations with Square roots. Topic 11: Solving Quadratic Equations by Factoring	Finish by 08/22	Completed: ☐	Topic 12: Factoring Quadratic Equations using the Formula.	Finish by 08/25	Completed: ☐

Topic 0: Summer Work Requirements

Question	Answer
1.) Will you receive credit for this packet if you don't show your work?	
2.) Where should you show your work for the questions in this packet?	
3.) How many problems are you expected to answer each week?	
4.) How can you get help with questions in this summer packet?	
5.) How will this summer packet be graded?	

Topic 1: Operations Involving Fractions

Adding and Subtracting Fractions: Report all your answers as reduced, improper fractions.			things to know before manipulating fractions Link 1 Link 2 Link 3
Question Number	Problem	Answer	Stuck? click on the links below for guidance
1.	$6 - \frac{4}{6}$		Add & Subtract fractions
2.	$\left(-\frac{4}{5}\right) - \frac{7}{8}$		
3.	$\frac{3}{8} + \left(-\frac{5}{6}\right)$		
4.	$\left(-\frac{8}{9}\right) - \left(-\frac{5}{12}\right)$		

Multiplying and Dividing Fractions: Report all your answers as improper fractions not mixed numbers			
Question Number	Problem	Answer	Stuck? click on the links below for guidance
1.	$-\frac{5}{4} \cdot \frac{1}{3}$		Multiplying Fractions Using Cancellation Multiplying Fractions - The Easy Way Learn how to divide two fractions with unlike denominators Dividing Fractions Using Cancellation
2.	$\frac{8}{7} \cdot \frac{7}{10}$		
3.	$\frac{4}{21} \cdot \frac{14}{12}$		
4.	$\frac{8}{15} \div \frac{12}{25}$		
5.	$\frac{9}{50} \div \frac{21}{40}$		

Topic 2: Exponent Rules

Properties of Exponents: Use the properties of exponents to simplify the following expressions. The following use only one rule of exponent to solve. THERE SHOULD BE NO NEGATIVE NUMBERS IN YOUR EXPONENTS			Exponent Properties- What are they? (One Step Examples)
Question Number	Problem	Answer	Stuck? click on the links below for guidance
1.	$a^3 b^5 \cdot a^5 b^{-3}$		Exponent Properties- Multistep Problems Using the property of exponents to multiply expressions Simplify rational expression using the rules of exponents Using multiple properties of exponents simplify the expression
2.	$7v^3 \cdot 10u^3 v^5 \cdot 8uv^3$		
3.	$\frac{4x^2 y^3 z^{12}}{2xy^2 z^7}$		
4.	$\frac{16x^3 y^5 z^4}{12xy^{-9} z^2}$		
5.	$(2b^2)^4$		
6.	$(3x^5 y^4)^3$		

Properties of Exponents: Use the properties of exponents to simplify the following expressions. The following will require you to use two or more rules to solve. THERE SHOULD BE NO NEGATIVE NUMBERS IN YOUR EXPONENTS			
Question Number	Problem	Answer	Stuck? click on the links below for guidance
1.	$\frac{18a^2 b^{-2} c^3}{36ab^2 c}$		
2.	$(x^2)^2 (3x)(2x^3)^2$		
3.	$\left(\frac{3}{5}c^2 f\right)\left(\frac{4}{3}c^2 d^3\right)^2$		
4.	$\frac{(2xy^{-1} z^2)^2}{(3x^{-2} y^5 z^{-3})^2}$		

Topic 3: Simplifying Square roots.

Simplifying Square Roots Express the following radical expressions as a product of an integer and square root in simplest form.			
Question Number	Problem	Answer	Stuck? click on the links below for guidance
1.	$\sqrt{80}$		How to Simplify the Square Root of a Non Square Number
2.	$\sqrt{45}$		Simplifying Radicals Easy Method
3.	$3 \cdot \sqrt{28x^5}$		Simplifying the square root of a square number and exponent
4.	$8 \cdot \sqrt{40x^9y^3}$		Simplifying the square root of an expression Simplifying Radicals with Variables and Exponents

Topic 4: Function Notation

Calculate the numerical value for each of the following expressions using the proper function.			MCR3U (1.2) - Function Notation Overview - Grade 11 Functions
Function 1 $f(x) = -2x^2 + x - 1$	Function 2 $g(x) = \frac{x^2 - 1}{x + 4}$	Function 3 $h(x) = \frac{1}{3}x + \frac{7}{4}$	
Question Number	Problem	Answer	Stuck? click on one of the links below for guidance
1.	$h(5)$		Function Notation Find Input for the Given Output
2.	$f(-1)$		Function Notation ❖
3.	$g(-3)$		
4.	$h(x) = 0$		
5.	$g(-x)$		
6.	$f(x + 1)$		

Topic 5: Linear Inequalities

Solve each of the linear inequalities below, graph their solution on a number line, and lastly provide the solution using interval notation.					
Question Number	Problem	Answer as an inequality	Answer in interval notation	Sketch the graph of the inequality	Stuck?
1.	$-5(1 - 4a) > -5$				Link 1
2.	$3(6b - 1) \geq 18 - 3b$				Link 2
3.	$20 - 2p > -2(p + 2) + 4p$				Link 3
4.	$2(1 - 4r) \leq -2(r + 3) - 4$				Link 4

Topic 6: Multiplying Polynomials

Multiplying Polynomial Expressions: Express your final answer as a polynomial in simplest form.			
Question Number	Problem	Answer	Stuck? click on one of the links below for guidance
1.	$(x + 5)(x - 3)$		Simplifying (variables/exponents/like terms)
2.	$(2x - 5)(3x + 4)$		Adding Polynomials: Algebra Animations
3.	$(3x + 7)^2$		Subtracting Polynomials: Algebra Animations
4.	$(2x^3 + 3)(4x^2 - 5)$		Multiplying Polynomials - Box Method
5.	$(2x + 1)(3x^2 + 5x - 6)$		Multiplying Polynomials Box Method Using the Box Method to Multiply a Trinomial by a Trinomial - Math Tutorial How to expand a binomial raised to the 3 power

Topic 7: Factoring GCF's

Factoring the Greatest Common Factor			
Question Number	Problem	Answer	Stuck? click on one of the links below for guidance
1.	$12x^2 - 27x$		Factoring Polynomials (GCF) (Algebra 1) Polynomials - GCF (Greatest Common Factor) Question #2 Learn how to factor a polynomial with x and y's by factoring out the GCF
2.	$12x^2 - 20x^3y$		
3.	$15x^5 - 80x^3 - 35x^2$		
4.	$49x^2y + 28x^3y^2 - 35x^4$		

Topic 8: Factoring Trinomials (Part 1)

Factoring Quadratic Trinomials where $A = 1$: Express your final answer as the product of two binomial factors. Make sure each factor is surrounded by a pair of parentheses.			
Question Number	Problem	Answer	Stuck? click on one of the links below for guidance
1.	$x^2 + 5x - 6$		
2.	$a^2 + 9x + 20$		
3.	$k^2 - 5k - 36$		
4.	$j^2 - 8j + 15$		

Topic 9: Factoring Trinomials (Part 2)

Factoring Quadratic Trinomials where $A = 1$: Check to make sure that you cannot factor out a Greatest Common Factor first. If you can, write this number in front of your final answer and divide this factor out from your problem before doing slip and slide.			
Question Number	Problem	Answer	Stuck? click on one of the links below for guidance
1.	$2x^2 + 5x - 3$		
2.	$3x^2 - 8x + 4$		
3.	$8x^2 - 10x + 3$		
4.	$6x^2 - 20x - 16$		
5.	$9x^2 + 75x + 24$		

Topic 10: Solving Quadratic Equations using Square Roots

Solve each equation by using inverse operations to isolate x^2 . Then use a square root to eliminate the exponent. Write your final answer as a simplified radical or reduced fraction instead of a decimal.

REMEMBER THAT QUADRATIC EQUATIONS HAVE 2 SOLUTIONS NOT 1

Question Number	Problem	Answer	Stuck? click on one of the links below for guidance
1.	$m^2 + 7 = 88$		
2.	$9x^2 = 64$		
3.	$9x^2 - 10 = 215$		
4.	$10 - 8x^2 = -310$		
5.	$(x + 5)^2 - 8 = 10$		

Topic 11: Solving Quadratic Equations by Factoring

Remember to make one side of each equation equal to zero. Then factoring the trinomial and set each factor equal to zero. REMEMBER THAT QUADRATIC EQUATIONS HAVE 2 SOLUTIONS NOT 1			
Question Number	Problem	Answer	Stuck? click on one of the links below for guidance
1.	$x^2 + 5x + 6 = 0$		Solve Quadratic Equations by Factoring
2.	$3x^2 - 17x + 10 = 0$		Solve Quadratic Equation by Factoring
3.	$4x^2 - 12x + 15 = 3x^2 - 4x$		
4.	$8x^2 - 2x + 5 = 4x + 10$		

Topic 12: Solving Quadratic Equations using the Quadratic Formula

Remember to make one side of each equation equal to zero. Then factoring the trinomial and set each factor equal to zero. REMEMBER THAT QUADRATIC EQUATIONS HAVE 2 SOLUTIONS NOT 1			
Question Number	Problem	Answer	Stuck? click on one of the links below for guidance
1.	$2x^2 + 5x - 12 = 0$		Solve quadratic equation with irrational roots
2.	$4x^2 + 7x - 15 = 0$		Ex: Quadratic Formula - Two Real Rational Solutions
3.	$4x^2 - 1 = 8x$		Ex1: Quadratic Formula - Two Real Irrational Solutions
4.	$2x^2 + 13 = 14x$		