Summer Review Packet for students entering Pre-Calculus

There are 4 due dates for the summer work. The assignments must be completed neatly, on a separate sheet of paper. All work must be shown. Calculators are permitted. It is NOT recommended to complete this packet immediately following school dismissal in June nor the night before the packet is due. Student learning is most effective if packet is completed during the months of July and August. The grade for the assignment will be inputted as a quiz grade.

Recommended Schedule:

Assignment	Recommended Completion Date
Week 1	July 8
Week 2	July 15
Week 3	July 22
Week 4	July 29

Week 1

Algebra 2 Summer Assignment

Identify the vertex, the axis of symmetry, the maximum or minimum value, and the range of each parabola.

1. $y = x^2 - 4x + 1$

2. $y = -x^2 + 2x + 3$

3. $y = -x^2 - 6x - 10$

4. $y = 3x^2 + 18x + 32$

5. $y = 2x^2 + 3x - 5$

6. $y = -3x^2 + 4x$

Graph each function.

7. $y = x^2 + 2x - 5$

8. $y = -x^2 + 3x + 1$

9. $y = 2x^2 + 4x - 4$

10. $y = -\frac{1}{2}x^2 - 3x + 3$

Week 2

Algebra 2 Summer Assignment

Divide using long division. Check your answers.

1. $(x^2 - 13x - 48) \div (x + 3)$

2. $(2x^2 + x - 7) \div (x - 5)$

3. $(x^3 + 5x^2 - 3x - 1) \div (x - 1)$

4. $(3x^3 - x^2 - 7x + 6) \div (x + 2)$

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

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

Determine whether each binomial is a factor of $x^3 + 3x^2 - 10x - 24$.

7. $x + 4$

8. $x - 3$

9. $x + 6$

10. $x + 2$

Divide using synthetic division.

11. $(x^3 - 8x^2 + 17x - 10) \div (x - 5)$

12. $(x^3 + 5x^2 - x - 9) \div (x + 2)$

13. $(-2x^3 + 15x^2 - 22x - 15) \div (x - 3)$

14. $(x^3 + 7x^2 + 15x + 9) \div (x + 1)$

Week 3
Algebra 2 Summer Assignment

Rewrite each expression using each base only once.

1. $4^5 \cdot 4^3$

2. $2^4 \cdot 2^6 \cdot 2^2$

3. $5^6 \cdot 5^{-2} \cdot 5^{-1}$

4. $10^{-4} \cdot 10^4 \cdot 10^2$

5. $7^9 \cdot 7^3 \cdot 7^{-10}$

6. $9^2 \cdot 9^{-8} \cdot 9^6$

Simplify each expression.

7. $z^8 z^5$

8. $-4k^{-3} \cdot 6k^4$

9. $(-5b^3)(-3b^6)$

10. $(13x^{-8})(3x^{10})$

11. $(-2h^5)(4h^{-3})$

12. $-8n \cdot 11n^9$

13. $mn^2 \cdot m^2n^{-4} \cdot mn^{-1}$

14. $(6a^3b^{-2})(-4ab^{-8})$

15. $(12mn)(-m^3n^{-2}p^5)(2m)$

Write each answer in scientific notation.

16. The population of a country in 1950 was 6.2×10^7. The population in 2030 is projected to be 3×10^2 times the 1950 population. If the projection is correct, what will the population of the country be in 2030?

17. The area of land that Rhode Island covers is approximately 1.5×10^3 square miles. The area of land that Alaska covers is a little more than 4.3×10^2 times the land area of Rhode Island. What is the approximate area of Alaska in square miles?

Week 3
Algebra 2 Summer Assignment

Simplify each expression.

18. $16^{\frac{1}{4}}$

19. $125^{\frac{1}{3}}$

20. $243^{\frac{1}{5}}$

21. $8^{\frac{2}{3}}$

22. $64^{\frac{4}{3}}$

23. $25^{\frac{3}{2}}$

Complete each equation.

27. $9^{-2} \cdot 9^{4} = 9^{\square}$

28. $5^{\square} \cdot 5^{3} = 5^{2}$

29. $2^{8} \cdot 2^{\square} = 2^{-2}$

30. $z^{\square} \cdot z^{-5} = z^{3}$

31. $m^{\frac{1}{3}} \cdot m^{\frac{1}{6}} \cdot m^{\square} = m^{2}$

32. $d^{7} \cdot d^{-13} \cdot d^{-9} = d^{\square}$

Week 4

Algebra 2 Summer Assignment

Compounding Interest

The formula for finding the amount of money accumulated in an account is

$$A = P\left(1 + \frac{r}{n}\right)^{nt}.$$

The variable ***P*** represents the **principal**, or amount initially invested.
The variable ***r*** represents the interest **rate** as a decimal.
The variable ***n*** represents the number of times per year the interest is **compounded**.
The variable ***t*** represents the **time**, or number of years for which the money is invested.

1. $750 is invested at 11% compounded quarterly. How much is in the account after 10 yr?

2. Write the new formula for $P = \$1$, $r = 1.0$, and $t = 1$ yr.

3. Remember that n is the number of times the interest is compounded. What happens as n grows? In other words, what is the effect of compounding more often? Fill in the following table. Round answers to eight decimal places.

n	$\left(1 + \frac{1}{n}\right)^n$
1	
10	
100	
1,000	
10,000	
100,000	
1,000,000	
10,000,000	
100,000,000	
1,000,000,000	

4. The table suggests that as n increases, the value of $\left(1 + \frac{1}{n}\right)^n$ gets closer to ______. If the value of n is increased further, the decimal approximation in the table will get very close to the value of a number known as e. This number is used in many growth and decay applications.

5. As n grows, you get closer to compounding continuously. This is why the formula used for compounding continuously is $A = Pe^{rt}$. Rework Exercise 1 assuming that compounding is continuous.