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Dear Parents/Guardians of students entering AP PreCalculus in September 2024,

This summer, your child will have the opportunity to prevent summer learning loss and to be better prepared for success in AP PreCalculus. He or she will also have the opportunity to earn up to ten extra credit points on the first mathematics test of the 2024-2025 school year.

Note: The assignment is attached to this letter. In order to receive credit, students must show ALL written work and submit it to their teacher by September 18, 2024.

Also, please do not wait until the end of summer to begin these skills.

Dawn Aiello
Director of Mathematics

Summer

Bridges from Algebra 2

to AP Precalculus

Name:_____

Class:_____

Directions: Show all work to receive full credit. You may attach additional pages if necessary.

Topic 1: Polynomials
Factor each polynomial completely AND find all zeros.

1) $x^2 + 9x - 70 = 0$

2) $x^2 - 2x - 24 = 0$

3) $x^2 - 225 = 0$

4) $10x^2 + 25x = 0$

5) $2x^2 - 32 = 0$

6) $x^2 - 6x + 9 = 0$

7) $6x^2 - 17x - 14 = 0$

8) $4x^2 + 21x - 18 = 0$

9) $5x^2 - 18x - 8 = 0$

10) $-15x^2 + 17x - 4 = 0$

11) $2x^3 + 4x^2 - 6x = 0$

12) $-49x^2 + 4 = 0$

Perform the indicated operation. Write the final answer in standard form.

13) $(2x^2 + 7x + 11) - (8x^2 - 5x + 7)$

14) $(4x^3 + 7x - 5) + (9x^3 - 4x^2 + 3)$

15) $(4x^5 - 5x^6)(4x^5 + 5x^6)$

16) $(3x^2 + 2x - 1)(x^3 + 3x - 4)$

17) $\dfrac{x^2 + 1}{x + 4}$

18) The polynomial $p(x) = x^3 - 6x^2 + 32$ has a known factor of $(x - 4)$. Rewrite $p(x)$ as a product of linear factors. Show all work.

19) The polynomial $p(x) = x^3 + 3x^2 - 4$ has a known factor of $(x - 1)$. Rewrite $p(x)$ as a product of linear factors. Show all work.

20) The polynomial $p(x) = 2x^3 + 17x^2 + 41x + 30$ has a known factor of $(x + 5)$. Rewrite $p(x)$ as a product of linear factors. Show all work.

Topic 2: Domain

Find the domain of the following expressions. Write all answers in interval form.

Reminders: The denominator of a fraction $\neq 0$.

The radicand of an even index radical ≥ 0.

[ ] values are included in the domain; ( ) values are excluded from the domain.

1) $3x^2 + 2x - 1$

2) $\dfrac{4}{3x}$

3) $\dfrac{\sqrt{x}}{x - 4}$

4) $\dfrac{1}{4x^2 - 25}$

5) $\dfrac{1}{\sqrt{(2x - 1)}}$

6) $\sqrt{(x + 6)}$

7) $\sqrt{(x^2 - 49)}$

8) $\dfrac{1}{x^2 + 3x - 18}$

Topic 3: Complex Numbers

Express the radical using the imaginary unit i. Simplify completely.

1) $\pm\sqrt{-35}$ 2) $\pm\sqrt{-24}$ 3) $\pm\sqrt{-98}$ 4) $\pm\sqrt{-150}$

Simplify. Show how you arrived at your answer:

5) i^{15} 6) i^{80} 7) $-i^{11}$ 8) $2i^{26}$

Perform each operation and simplify:
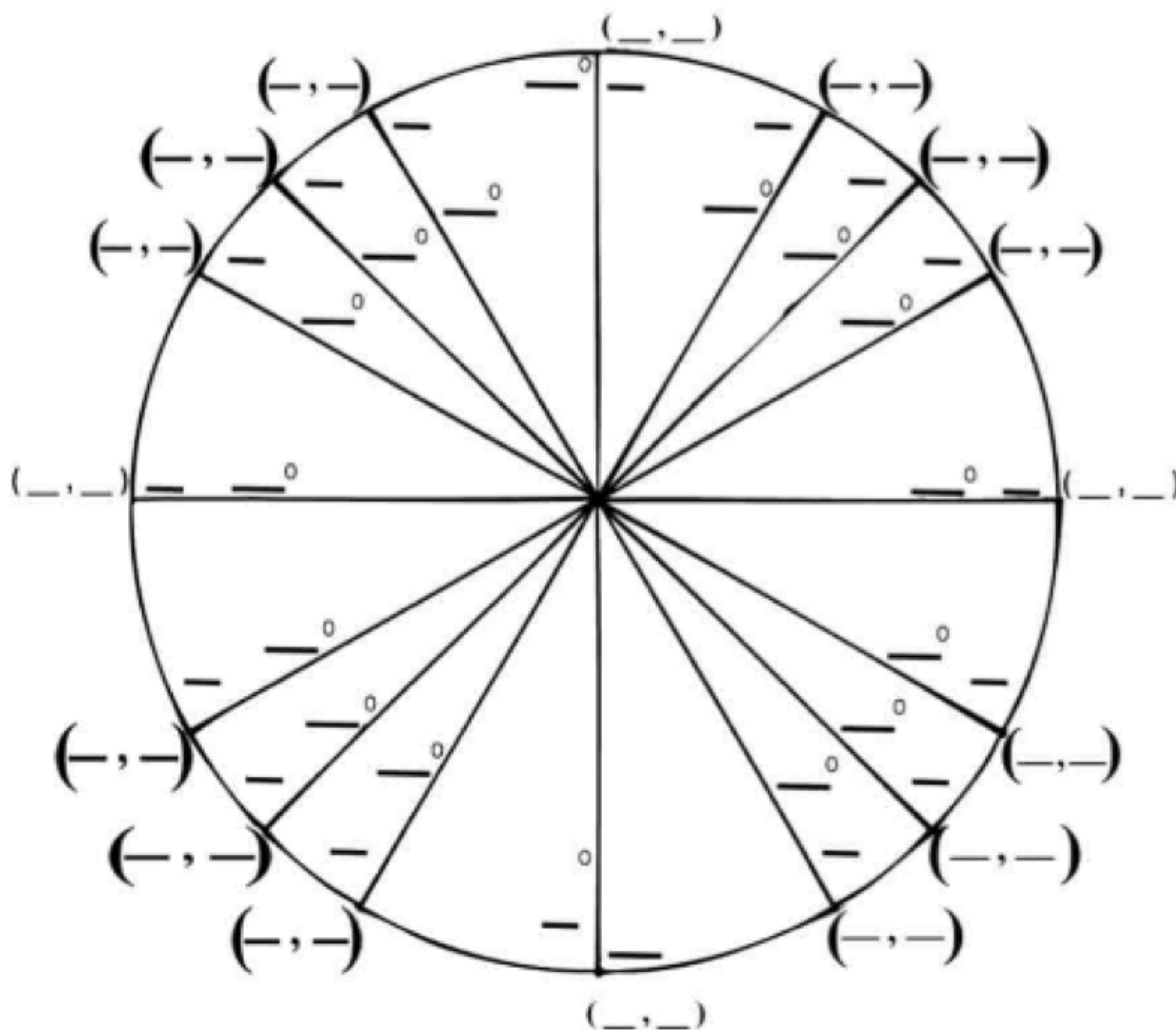
9) $(1 + i)(3 - 5i)$ 10) $(1 - 5i)(3 - 2i)$ 11) $2i - (3i + 7)$

12) Find the solutions of the quadratic equation $6x^2 + 5x + 4 = 0$. Express your answer in the form $a \pm bi$.

Topic 4: The Unit Circle

Fill in the unit circle. Include angle measures in both radians and degrees. Then, use the unit circle to answer the questions below.

Find the exact value of each trigonometric function.

1) sin 210°

2) cos $\frac{5\pi}{6}$

3) tan $\frac{7\pi}{4}$

4) cot π

5) sec 90°

6) sin $\frac{3\pi}{2}$

7) csc 120°

8) tan $\frac{11\pi}{6}$

Find all possible values for θ using trigonometric inverses.

9) sinθ = $\frac{\sqrt{3}}{2}$

10) cosθ = $\frac{-1}{2}$

11) tanθ = - 1

12) sinθ = $\frac{\sqrt{2}}{2}$