Welcome to Advanced Precalculus/Calculus! This course is an **accelerated** course, so over the summer you need to make sure that all prerequisite skills are in the best shape possible in your mind. This packet is designed to help guide that studying by offering review for some of the main prerequisite skills needed to be successful in the course.

The course is designed as a two year program so that the first year you complete the Advanced Precalculus/Calculus and the next year you go on to AP Calculus BC (although AP Calculus AB is also an option for those not quite ready to take on AP Calculus BC).

As preparation within the two year program for one of the two AP Calculus exams you might take at the end of the two years, each semester's course is rigorous. It is VITAL that you come for help <u>as soon as</u> you need it.

Your final answers can be written on the answer page within this document to make for an easy check in August; however, all of your work should be done out on separate paper and properly labeled with the topic heading and problem number to be attached and turned in upon your return to school. This assignment is due BEFORE Labor Day weekend. You will receive another assignment to complete over the Labor Day weekend from the text book you will receive in August.

Calculator use should be **minimal**. You can check your answers with your calculator, but should be able to complete all problems without, and it will be expected on quizzes and tests that you can complete these skills **without** a calculator.

Enjoy your summer and see you in August!

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Note: The summer packet is due the first week of school, graded as a homework assignment and used to review for a formative assessment.

ALGEBRA I SKILLS:

1. **Solve each equation.**

    (a) $7x + 2 = 3x + 94$ (b) $15 - a = 23 - 2a$ (c) $4w - 2(5 - w) = -38$

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2. **Solve each formula for the indicated variable.**

    (a) $V = \pi r^2 h$ for r (b) $T = st^2 - 3s$ for s   (c) $V = s^2 + \frac{1}{2}sh$ for h

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Evaluate each function for the indicated values.

3. $f(x) = 3x - 5$

    (a) $f(2)$ (b) $f(-3)$ (c) $f\left(\frac{3}{2}\right)$ (d) $f(x + 2)$ (e) $f(3 - x^2)$

4. $g(x) = x^2 + 3x - 7$

    (a) $g(2)$ (b) $g(-3)$ (c) $g\left(\frac{3}{2}\right)$ (d) $g(x + 2)$ (e) $g(3 - x^2)$

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5. **Write the equation for the line through the given points in <u>point-slope form</u>.**

    (a) $(1, 6)$ and $(8, -1)$ (b) $(9, 4)$ and $(9, 7)$ (c) $(5, -6)$ and $(8, -6)$

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6. **Simplify (leave <u>no</u> negative exponents).**

    (a) $(-3x^3)^2(5xy^2)$ (b) $\dfrac{r^3 t^{-7}}{t^3}$ (c) $\left(\dfrac{a^3}{m}\right)^{-4}$

ALGEBRA II SKILLS:

7. **Solve each system by the method of your choice (substitution or elimination).**

    (a) $\begin{cases} y = x - 2 \\ y = -2x + 7 \end{cases}$ (b) $\begin{cases} x + y = 12 \\ x - y = 2 \end{cases}$ (c) $\begin{cases} 4x + 2y = 7 \\ y = 5x \end{cases}$

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8. **Factor each expression completely.**

    (a) $x^2 + 4x - 5$ (b) $5x^2 y^2 - 30x^3 y$ (c) $x^3 - 5x^2 + 4x - 20$

    (d) $x^4 - 2x^2 - 3$ (e) $6x(x + 3)^2 + 42x^2(x + 3)$

9. **Solve each quadratic equation by factoring.**

   (a) $x^2 + 6x + 8 = 0$

   (b) $3x^2 = 16x + 12$

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10. **Solve each quadratic equation by taking roots.**

    (a) $5x^2 = 80$

    (b) $5x^2 - 40 = 0$

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11. **Solve each quadratic equation by using the Quadratic Formula.**

    (a) $x^2 - 4x + 3 = 0$

    (b) $3x^2 + 10 = -4x$

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12. **Simplify each radical expression.**

    (a) $\dfrac{\sqrt{500}}{\sqrt{5}}$

    (b) $\sqrt{8x^5} \cdot \sqrt{40x^2}$

    (c) $7\sqrt{2} - 3\sqrt{18}$

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13. **Solve each radical equation. Be sure to check for extraneous solutions.**

    (a) $3\sqrt{x} + 3 = 21$

    (b) $\sqrt{x+7} - x = 1$

    (c) $(x+5)^{2/3} = 4$

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14. **Find each composition of functions, given that $f(x) = x^2$, $g(x) = 3x + 4$, $h(x) = 2x^2 + 1$.**

    (a) $f(g(x))$

    (b) $g\big(h(x^3)\big)$

    (c) $h\big(f(2x)\big)$

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15. **Find the *x*- and *y*-intercepts for each.**

    (a) $y = x^2 + x - 2$

    (b) $y = x\sqrt{16 - x^2}$

    (c) $y^2 = x^3 - 4x$

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16. **Simplify each complex fraction.**

    (a) $\dfrac{\dfrac{1}{x} - \dfrac{1}{3}}{1 + \dfrac{1}{x}}$

    (b) $\dfrac{\dfrac{4}{x+2}}{\dfrac{x}{x+2} - 1}$

    (c) $\dfrac{\dfrac{1}{x+3} - \dfrac{1}{x-1}}{\dfrac{1}{x^2+2x-3}}$

ADVANCED PRECALCULUS/CALCULUS SUMMER ASSIGNMENT

FINAL ANSWER SUMMARY PAGE – Please write your final answer for each question in the appropriate box below. Be sure your work on separate paper is attached.

ALGEBRA I SKILLS:

1(a)	1(b)	1(c)
2(a)	2(b)	2(c)
3(a)	3(b)	3(c)

3(d)	3(e)

4(a)	4(b)	4(c)

4(d)	4(e)

5(a)	5(b)	5(c)
6(a)	6(b)	6(c)
7(a)	7(b)	7(c)
8(a)	8(b)	8(c)

8(d)	8(e)
9(a)	9(b)

10(a)	10(b)
11(a)	11(b)

12(a)	12(b)	12(c)
13(a)	13(b)	13(c)
14(a)	14(b)	14(c)
15(a)	15(b)	15(c)
16(a)	16(b)	16(c)