Dear Parents and Students,
I would like to take this opportunity to congratulate you on your acceptance into Honors Algebra I/Geometry at St. John's College High School. Every student in the class has completed Algebra I prior to entering SJC, and some have also completed Geometry.

Some of you are wondering why you are taking Algebra I again when you completed it in a previous year. From our experience as a department, there are topics that your 7th or 8th grade teacher may not have covered or spent very little time covering. Each of these topics is different, depending on the school. Our job as a department is to fill in the gaps for every student and prepare you for success in Algebra II and beyond.

We will spend the first semester reviewing and expanding the algebraic topics to better prepare you for Algebra II. The second semester is spent covering Geometry to prepare you for the Trigonometry portion of Algebra II and Pre-Calculus. The pace of this course is very fast, as we complete both Algebra I and Geometry in a single school year. This fast pace is the reason for the summer homework packet.

The topics covered in this packet are just some of the algebraic concepts that should have been covered in 7th or 8th grade. These are also just some of the topics that we will cover during the first semester of the school year. We do not cover order of operations or solving equations, as these are topics covered by every Algebra 1 course, so please pay close attention to questions 1-17 and make sure that you can complete these questions.

The final two pages will be covered during the first semester, so we will use the packet to help plan the topics and the amount of time needed to cover each topic. Please do not get help from anyone on this packet. There is no need for a tutor to complete the packet, as that would give the impression that each of these topics was covered in 7th or 8th grade.

This packet is due on the first full day of class and not at Freshman Orientation. If you need to replace a lost packet, please look under My St. John's heading on the SJC website (www.stjohnschs.org) and click on Summer Projects.

A graphing calculator is required for the course, and I recommend any of the TI-84 graphing calculators. I will use a TI-84 with an overhead attachment during class when covering certain topics. If you currently have a TI-83, TI-85, TI-86 or TI-89, they may also be used. The TI-85, TI-86 and TI-89 are more confusing to use and more expensive. The TI-84s can be used for all four years of high school math, including AP Calculus AB and AP Calculus BC, while also being the only calculator for AP Statistics as it comes preprogrammed with a statistics package.

If you have any questions or concerns, please contact me at hgriffin@stjohnschs.org. We look forward to working with each of you during the 2024-2025 school year.
Sincerely,
Haley Griffin
SJC Math Department

Chapters P-2 Review

Use separate sheet(s) for your work and answers.

#'s 1-5, Simplify each expression using a=3, b=-5, c=-2 and d=$\frac{2}{3}$.

1) $8a - \frac{1}{2}(2a^2 - bc)^2$

2) $\frac{(abcd)^2}{4b}$

3) $bd + \frac{4b}{a^3 + 3c^3}$

4) $3\left(4a - b - c^4\right)^5 + c$

5) $c + d\left[(a + 2c)^3 \div d - 3a\right]^2$

#'s 6-13, Solve each equation. Leave all answers as an integer or a fraction. If the answer is a decimal, convert the decimal to a fraction.

6) $9x - 5x - 19 = 21$

7) $9x - 19 = -5x + 21$

8) $\frac{-4}{9}(2x - 4) = 48$

9) $-4(x - 3) = -x$

10) $8a - 4(-5a - 2) = 12a$

11) $-\frac{2}{5}x = 10$

12) $4.2x + 5 = 12(2.5 - 3x)$

13) $\frac{3}{4}(24 - 8b) = 2(5b + 1)$

14) Solve for y: $\frac{1}{5}(25 - 5y) = 4x - 9y + 13$

#'s 15-17, Solve each word problem completely.

15) Two cars travel the same distance. The first car travels 40 mph and reaches it's destination in t hours. The second car travels at a rate of 55 mph and reaches it's destination 3 hours earlier than the first car. How long does it take car one to reach the destination?

16) Currently you have $60, and your sister has $135. You decide to save $5 per week while your sister spends $10 per week. How many weeks will it be until you and your sister have the same amount of money?

17) You have $8,400 to spend on a car. If the car has a 5% sales tax added to the sticker price, what is the maximum sticker price the car could be so that you do not go over the $8400?

The following questions are topics that should have been covered in Algebra I. We start in Chapter 3 in your textbook and will expand each of these topics during the semester to better prepare you for all your future math courses.

18) Find the slope between $(-3,4)$ and $(-7,2)$.

19) Graph $\frac{1}{2}x - 3y = 6$ using the x and y intercepts only (use graph paper).

20) Graph $y = \frac{-2}{5}x + 3$ using the slope and y-intercept only (use graph paper).

21) Determine the equation of the line that contains (-1, 3) and (1, 7) in slope-intercept form.

22) Determine the equation of the line parallel to $2x - 3y = 6$ and contains the point $(-3,5)$ in point-slope form.

23) Determine the equation of the line perpendicular to $2x - 3y = 6$ and contains the point $(-3,5)$ in standard form.

24) Solve the inequality and graph the solution on a number line.

$$30 \le -5x + 10 \le 60$$

25) Graph $\frac{1}{2}x + \frac{2}{3}y < 10$ on graph paper.

26) Solve $|2x - 6| + 4 = 12$

27) Solve the system of equations using substitution.

$$3x - 2y = 12$$
$$x - y = 60$$

28) Solve the system of equations using elimination.

$$3x + 9y = 1$$
$$2x + 3y = \frac{2}{3}$$

29) Simplify $\left(\frac{-3x^3y^{-5}}{9x^6y^{-8}}\right)^{-2}$

30) Simplify $\left(\frac{5xy}{8x^{-1}y^2}\right)^2\left(\frac{24y^3}{5x^2y^5}\right)$

31) Use Scientific Notation to simplify. Leave answer in Scientific Notation.
$(2.4\times10^9)(3.1\times10^5)$

32) A business had an $11,000 profit in 1995. The profit increased by 15% each year for the next 5 years. Write the exponential growth model and determine the profit for the year 2000.

33) Simplify $(3x^3 + 2x^2 - 4) - (4x^3 - 4x + 5)$

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

#'s 35-40, Factor each polynomial.

35) $x^2 + 11x - 26$

36) $x^2 - 9x + 18 - 2x$

37) $3x^2 - 17x + 10$

38) $6x^3 - 3x^2 - 18x$

39) $4x^2 - 100$

40) $3x^3 + 5x^2 - 12x - 20$

#'s 41-44, Simplify (no decimals).

41) $\sqrt{500x^6y^9}$

42) $\left(2 - 6\sqrt{3}\right) + \left(7 + 2\sqrt{3}\right)$

43) $\dfrac{14\sqrt{3}}{\sqrt{2}}$

44) $\left(4 - 3\sqrt{2}\right)^2$

#'s 45-48, Solve each equation (leave answer in simplified radical form)

45) $3x^2 - 7 = 2(x^2 + 3)$

46) $\sqrt[3]{5z - 4} + 7 = 10$

47) $2x^3 + 7x^2 + 3x = 0$

48) $6x^2 = 2x + 5$

49) Graph the parabola $y = 2x^2 + 4x - 6$ (on graph paper)

50) Graph $y = 2\sqrt{3x - 4} + 1$ (on graph paper)

#'s 51-53, simplify each rational expression

51) $\dfrac{x^2 - 3x - 4}{x^2 - 13x + 36}$

52) $\dfrac{x^2 - 36}{2x^2 + 3x + 1} \div \dfrac{4x - 24}{8x + 4}$

53) $\dfrac{6}{x + 2} - \dfrac{1}{x + 3}$

54) Solve $\dfrac{x}{x - 3} + x = \dfrac{3x - 4}{x - 3}$

55) You make 6 posters to hold up at a basketball game. Each poster has a letter of the word CADETS. You and 5 friends sit next to each other in a row. The posters are distributed at random. What is the probability that CADETS is spelled correctly when you hold up the posters?