Entering Algebra I Prequisite

Purpose:

This summer practice assignment was created to

- communicate to each student what she is expected to know prior to entering Algebra I.
    - The topics in this assignment were taught in previous math courses.
- provide an opportunity for students to practice those skills and concepts necessary for success in Algebra I.
- provide your Algebra I teacher with information about the skills in which you may need more practice.

Expectations:

- Students are expected to complete this assignment independently.
- For each question in this assignment, show all of your work and your answers on loose leaf paper.
    - Your work must be clearly labeled and easy to follow.
- Box your final answers.
- Check your final answers with the key.
- **This assignment will be graded for completion and entered as a quiz grade.**
    - **You are expected to**
        - **complete every problem.**
        - **check your answers with the key.**
        - **mark the questions you answered incorrectly.**
    - **This assignment is DUE on first day of class. NO EXCEPTION.**
    - **If you turn in this assignment after the first day of school, 10 percentage points will be deducted for each day it is late.**

Students entering Algebra I are expected to know how to:

- evaluate and simplify expressions
- apply the order of operations
- write algebraic expressions, equations and inequalities
- solve linear equations
    - one-step equations
    - two-step equations
    - multi-step equations
    - with variables on both sides
- rewrite equations and formulas
- plot points in a coordinate plane
    - identify x-intercepts
    - identify y-intercepts
- find the slope between two points
- graph linear equations written in slope-intercept form

These skills will be incorporated into the Algebra I course throughout the school year.

As a member of the Sacred Heart Community,
I pledge to act in a moral, ethical, honest, and honorable way in all that I do.

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Student Signature

For each question in this assignment, show all of your work on loose leaf paper. Remember to check your final answers with the key. Your work must be clearly labeled and easy to follow.

Topic 1: Evaluate expressions

Evaluate each expression. Write your final answers as improper fractions if necessary. You are expected to complete this section without a calculator. Remember to show each step for questions 6 – 10.

1. $\frac{9}{5}-\frac{1}{2}$ **2.** $-5-8$ **3.** $-7+(-4)$ **4.** $5+\frac{3}{4}-6$ **5.** $-\frac{3}{7}-\left(-\frac{1}{3}\right)+2$

6. $3[15-(2^3-6)^2]+2$ **7.** $8q^2+7(r-3)-r$ when $q=2$ and $r=10$

8. $\frac{2m-n}{m^2-2n+2}$ when $m=5$ and $n=3$ **9.** $21.7-14.314\div 3.4+5.1$ (round your answer to the nearest hundredth)

10. $-2(6+7)-8\div 4$ **11.** $\left(\frac{3}{4}\right)\left(-\frac{1}{5}\right)(-2)$ **12.** $\left(\frac{5}{8}\right)\div\left(\frac{4}{5}\right)$ **13.** $\left(\frac{7}{9}\right)\div\left(\frac{1}{3}\right)(-12)$

Topic 2: Simplify expressions

Simplify each expression.

14. $6x-2-2+6x$ **15.** $r+2+5r+7$ **16.** $-8x+4y-10+11y-x+5$ **17.** $-6(1+6a)$

18. $8(-3m-4)$ **19.** $-5(3r-7)$ **20.** $-\frac{3}{4}(12d-20)$

Topic 3: Write algebraic expressions, equations and inequalities

For questions 21 – 26, translate the statement into an expression, an equation or an inequality.

21. Seven less than twice a number n.

22. Three times a number, decreased by the sum of another number squared and eight.

23. The quotient of a number h and 9 is at most 28.

24. The difference of a number b and 7 is no less than 10 and no more than 21.

25. You are making beaded bracelets for your friends. You plan to use 30 beads for each bracelet and want to use no more than 145 beads. **Write an inequality that models this situation, where b represents the number of bracelets you can make.**

26. Write a variable expression for the volume of the cube whose side length is x.

27. A rectangle is twice as long as it is wide.

a) Write a variable expression to represent the perimeter of the rectangle.

b) Write a variable expression to represent the area of the rectangle.

Topic 4: Solve linear equations

Solve each equation. Show each step. Write your final answers as improper fractions if necessary.

28. $-4=x-18$ **29.** $-21m=420$ **30.** $\frac{d}{4}+10=\frac{3}{4}$ **31.** $\frac{7-2a}{-5}=6$

32. $5w+24=5(w-5)$ **33.** $12n+2-3n=5-(n-2)$ **34.** $\frac{1}{2}x+\frac{2}{3}=\frac{1}{3}x-\frac{3}{2}$

35. $\frac{1}{4}(60+16w)=15+4w$ **36.** $3(3h+1)-(h-1)=6(h+10)$

Topic 5: Write and solve proportions

Solve each proportion. Show each step. Write your final answers as improper fractions if necessary.

37. $\frac{2w}{16}=\frac{30}{80}$ **38.** $\frac{7}{112}=\frac{c-3}{8}$ **39.** $\frac{p+15}{42}=\frac{p-5}{14}$

Topic 6: Write and solve proportions

40. Assign a variable, write a proportion to represent the situation, solve the proportion, then answer the question.

Kelli works in the local mailroom at a college. One of her duties is to sort local mail from all of the other mail. She can sort 8 pieces of mail in 10 seconds. How many pieces should Kelli be able to sort in 45 minutes?

41. Assign a variable, write a proportion to represent the situation, solve the proportion, then answer the question.

At an aquarium the ratio of freshwater fish to saltwater fish is 3 to 5. Determine the number of each kind of fish if the aquarium has 640 fish. How many more saltwater fish are there than freshwater fish?

Topic 7: Write and solve linear equations

42. Assign a variable, write an equation to represent the situation, solve the equation, then answer the question.

The length is 5 inches more than the width. The perimeter is 9 times the width. Find the length and width of the rectangle described.

43. Assign a variable, write an equation to represent the situation, solve the equation, then answer the question.

The membership fee for joining a gardening association is $24 per year. A local botanical garden charges members of the gardening association $3 for admission to the garden. Nonmembers of the association are charged $6. After how many visits to the garden is the total cost for members, including the membership fee, the same as the cost for nonmembers?

44. Assign a variable, write an equation to represent the situation, solve the equation, then answer the question.

You helped Daisy move into a new apartment. Daisy rented a truck for $15 an hour and a dolly for $5. She paid a total of $80 for the rental. For how long did Daisy rent the truck?

45. Assign a variable, write an equation to represent the situation, solve the equation, then answer the question.

A car dealership sold 78 new cars and 67 used cars this year. The number of new cars sold by the dealership has been increasing by 6 cars each year. The number of used cars sold by the dealership has been decreasing by 4 cars each year. If these trends continue, in how many years will the number of new cars sold be twice the number of used cars sold?

46. Assign a variable, write an equation to represent the situation, solve the equation, then answer the question.

Information about students who take Spanish and students who take French at a high school is shown in the table. If the trends continue, in how many years will there be 3 times as many students taking Spanish as French?

Language	Students enrolled this year	Average rate of change
Spanish	555	33 more students each year
French	230	2 fewer students each year

Topic 8: Rewrite equations and formulas

Solve for the indicated variable.

47. $C = 2\pi r$ for π

48. $D = \frac{C-S}{n}$ for C

49. $Ax + By = C$ for y

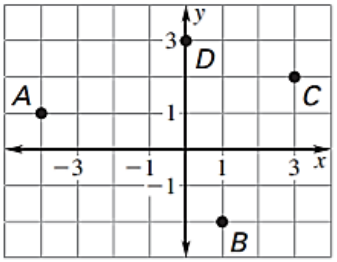
50. $D = A + \frac{1}{3}Bc$ for c

Topic 9: Plot points in the coordinate plane

Plot the following coordinates points on a coordinate plane then identify the quadrant in which the point is located. If the coordinate is an x-intercept or y-intercept, state it. Use graph paper, label your axes and scale. Remember to label each coordinate point with the assigned letter.

51. $R(-5,-1)$ **52.** $S(-3,4)$ **53.** $T(4,-1)$ **54.** $U(5,5)$ **55.** $V(0,-2)$ **56.** $W(-1,0)$

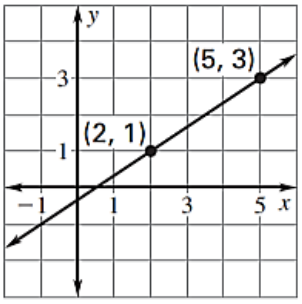
57. Give the coordinates of the points labeled $A, B, C,$ and D.



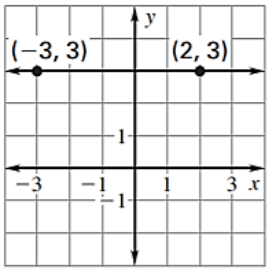
Topic 10: Find the slope between two points

Find the slope of the line that passes through the points.

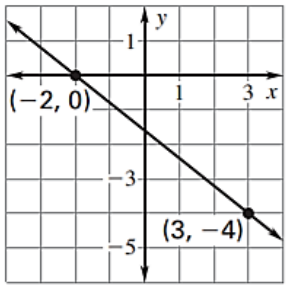
58.



59.



60.



61. $(-4,-5)$ & $(-3,-2)$ **62.** $(-7,-1)\&(-7,5)$

Topic 11: Find the Greatest Common Factor

Find the GCF of each.

63. $65, 52xy$ **64.** $56u^2v, 56v^2u$ **65.** $40, 50, 20mn$ **66.** $23, 7x^2, 59xy$

67. $-9x^2 + 15x$ **68.** $45xy, 55x^2, 80xy$ **69.** $56u^2, 16u^3, 80v^2u$ **70.** $12a^2 + 4a$

71. $6x^2 - 9x$ **72.** $5x + 5$ **73.** $3n^3 - 3n^2$

Answers:

1. $\frac{13}{10}$ **2.** -13 **3.** -11 **4.** $-\frac{1}{4}$ **5.** $\frac{40}{21}$ **6.** 35 **7.** 71 **8.** $\frac{1}{3}$

9. 22.59 **10.** -28 **11.** $\frac{3}{10}$ **12.** $\frac{25}{32}$ **13.** -28 **14.** $12x-4$ **15.** $6r+9$

16. $-9x+15y-5$ **17.** $-36a-6$ **18.** $-24m-32$ **19.** $-15r+35$ **20.** $-9d+15$

21. $2n-7$ **22.** $3x-(y^2+8)$ **23.** $\frac{h}{9}\leq 28$ **24.** $10\leq b-7\leq 21$ **25.** $30b\leq 145$

26. x^3 **27. a)** $6w$ **b)** $2w^2$ **28.** $x=14$ **29.** $m=-20$ **30.** $d=-37$

31. $a=\frac{37}{2}$ **32.** No solution **33.** $n=\frac{1}{2}$ **34.** $x=-13$ **35.** All real numbers

36. $h=28$ **37.** $w=3$ **38.** $c=\frac{7}{2}$ **39.** $p=15$

40. Variable: Let $m=$ # of pieces of mail; Proportion: $\frac{m}{2700}=\frac{8}{10}$; $m=2160$. Kelli can sort 2,160 pieces of mail in 45 minutes.

41. *Sample Answer:* Variable: Let $x=$ # of freshwater fish; Proportion: $\frac{x}{640}=\frac{3}{8}$; $x=240$.
There are 240 freshwater and 400 saltwater fish in the aquarium. There are 160 more saltwater fish than freshwater fish.

42. Variable: Let $w=$ width of the rectangle; Equation: $9w=2(5+w)+2w$; $w=2$. The width of the rectangle is 2 inches, and the length of the rectangle is 7 inches.

43. Variable: Let $n=$ # of visits to the garden; Equation: $3n+24=6n$; $n=8$. After 8 visits to the garden, the total cost for members will be the same as the cost for nonmembers.

44. Variable: Let $h=$ # of hours Daisy rented the truck; Equation: $15h+5=80$; $h=5$. Daisy rented the truck for 5 hours.

45. Variable: Let $y=$ # of years; Equation: $78+6y=2(67-4y)$; $y=4$. If these trends continue, in 4 years the number of new cars sold will be twice the number of used cars sold.

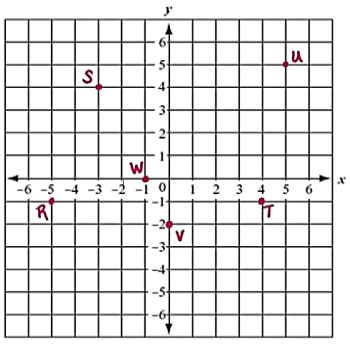
46. Variable: Let $y=$ # of years; Equation: $555+33y=3(230-2y)$; $y\approx 3.5$. If these trends continue, in approximately 3 ½ years the there will be three times as many students taking Spanish as French.

47. $\pi=\frac{C}{2r}$ **48.** $C=Dn+S$ **49.** $y=\frac{-Ax+C}{B}$ **50.** $c=\frac{3(D-A)}{B}$ **51.** Quadrant III

52. Quadrant II **53.** Quadrant IV **51 – 56, refer to the graph:**

54. Quadrant I **55.** y-intercept

56. x-intercept



57. $A(-4,1), B(1,-2), C(3,2), D(0,3)$ **58.** $\frac{2}{3}$ **59.** 0

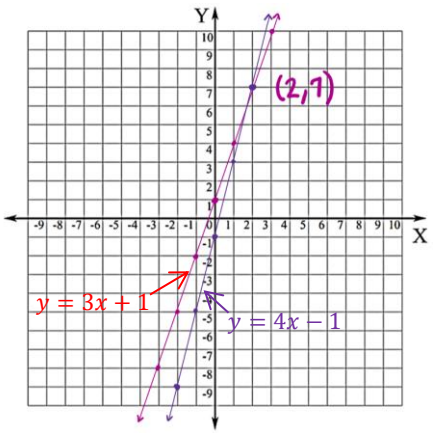
60. $-\frac{4}{5}$ **61.** 3 **62.** Undefined **63.** 13 **64.** $56uv$

65. 10 **66.** 1 **67.** $3x$ **68.** $5x$ **69.** $8u$

70. $4a$ **71** $3x$ **72.** 5 **73.** $3n^2$

67. $(-3, 3)$

68.



69. No solution

70. $(0, 2)$

71. $(1, 3)$

72. C; work or explanation is required

73. Variables: Let $c =$ price for 1 pound of coffee, and $t =$ price for 1 pound of tea;

System of Equations: $\begin{cases} 12c + 4t = 104 \\ 15c + 7t = 146 \end{cases}$ Answer: The price for one pound of tea is \$8.

74. Variables: Let $c =$ number of children who attended the fair, and $a =$ number of adults who attended the fair;

System of Equations: $\begin{cases} 1.5c + 4a = 5{,}050 \\ c + a = 2{,}200 \end{cases}$ Answer: 1,500 children attended the fair that day.

75. Variables: Let $x =$ one number, and $y =$ another number;

System of Equations: $\begin{cases} x + y = 210 \\ x - y = 30 \end{cases}$ Answer: The two numbers are 90 and 120.

76. Variables: Let $y =$ number of years, and $V =$ value of the house;

System of Equations: $\begin{cases} V = 200{,}000 + 10{,}000y \\ V = 350{,}000 - 5{,}000y \end{cases}$ Answer: The house will have the same value after 10 years.