Algebra I Summer Packet

Name: _____

2019

This packet is **strongly** recommended to be completed prior to the start of school. Students should be comfortable with these skills prior to the beginning of class in order to progress through the Algebra curriculum comfortably.

Students will review the concepts contained in this packet during the first few days of class. Following this review, students will be assessed on the material covered in this packet. The **assessment** will be graded for accuracy and will be part of the first marking period grade.

Students may use online resources such as Khan Academy Videos to assist in learning topics that they are finding difficult. Video links have been placed throughout the text for additional help with each topic.

Section 1: Variables and Expressions

https://learnzillion.com/lessons/465-read-and-write-an-algebraic-expression-containing-a-variable

Write an algebraic expression for each phrase.

1. The sum of 12 and a number _____
2. The difference of a number tripled and a number doubled _____
3. The product of 2 times a and 5 times b _____
4. 12 less than the quotient of 12 and a number z _____
5. 5 greater than the product of 3 and a number q _____

Section 2: Order of Operations and Evaluating Expressions

https://www.youtube.com/watch?v=-jflJKmsAEc

Simplify each expression.

6. $5[(4 + 8) - 3^3]$

7. $(6^2 + 4) - 15$

8. $\frac{3-6}{2+1}$

9. $-3\sqrt{4^4 + 9} + 7$

Evaluate each expression for the given values of the variables.

10. $2m^2 - 3n + 4$; $m = -2, n = 3$

11. $-t\,[t^2 - (23 - v^2) + 3]$; $t = -2, v = 5$

Evaluate each expression below for $m = -4, n = 5$, and $p = 1.5$.

12. $p - m$

13. $n + m - p$

Section 3: Real Numbers and the Number Line

https://www.youtube.com/watch?v=mXhAf0n0wDc

Find each product or quotient.

14. $(-9)^2$

15. $\frac{-3}{4} \cdot \frac{2}{9}$

16. $\frac{-(-8)}{2(2)}$

17. $\frac{84}{-4}$

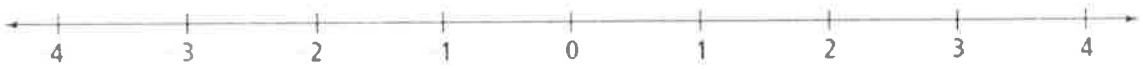
Comparing Real Numbers.

https://www.youtube.com/watch?v=9iSSQ0Zu3mM

18. Use $\leq$, $\geq$, $<$, $>$, or $=$ to complete the statement. $\sqrt{129}$ _____ 11.52

19. a. Graph the numbers below on a number line.

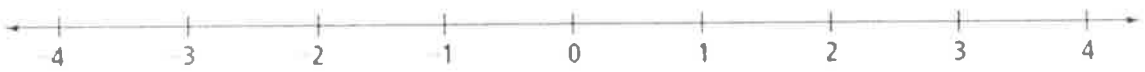
$$3.5, -2.1, \sqrt{9}, -\frac{7}{2}, \sqrt{5}$$



b. What is the order of the numbers from least to greatest? _____

20. a. Graph the numbers below on a number line.

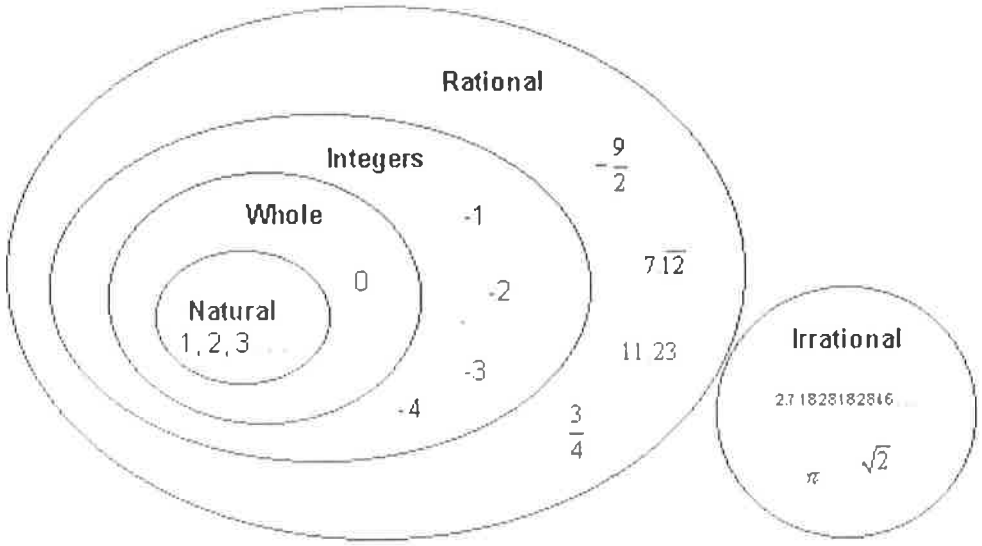
$$-2.5, \sqrt{16}, -\frac{4}{3}, 3.1, \sqrt{6}$$



b. What is the order of the numbers from least to greatest? _____

The Real Number System

https://www.youtube.com/watch?v=9orS7coe2WI



21. Circle all of the subsets of the real numbers that each number belongs to.

a.	$\sqrt{77}$	Natural	Whole	Integers	Rational	Irrational
b.	-4	Natural	Whole	Integers	Rational	Irrational
c.	$\frac{2}{3}$	Natural	Whole	Integers	Rational	Irrational
d.	0	Natural	Whole	Integers	Rational	Irrational
e.	0.625	Natural	Whole	Integers	Rational	Irrational

Section 4: The Distributive Property

https://www.youtube.com/watch?v=QzwvSp-ZtBY

Use the Distributive Property to simplify each expression. Combine like terms when possible.

22. $3(h-5)$

23. $4\left(\frac{1}{2}t-5\right)$

24. $-(-x+y-1)$

25. $4(2h+1)+3(4h+7)$

26. $7(3+x)-4(x+1)$

27. $3(2x+3)-(4x-5)$

Section 5: Perfect Squares and Square Roots

Identify each perfect square.

$1^2 =$____ $2^2 =$____

$3^2 =$____ $4^2 =$____

$5^2 =$____ $6^2 =$____

$7^2 =$____ $8^2 =$____

$9^2 =$____ $10^2 =$____

$11^2 =$____ $12^2 =$____

$13^2 =$____ $14^2 =$____

$15^2 =$____ $16^2 =$____

$17^2 =$____ $18^2 =$____

$19^2 =$____ $20^2 =$____

Simplify each expression without a calculator:
https://www.youtube.com/watch?v=7G5zut5_1yk

28. $\sqrt{64}$ 29. $\sqrt{225}$

30. $\sqrt{0.25}$ 31. $\sqrt{\frac{16}{121}}$

Section 6: Absolute Values

Evaluate each absolute value expression.

https://www.youtube.com/watch?v=aa_ek-4LfWc

32. $|2 - 8|$

33. $3|-4| + 5$

34. $-2|5(4) - 6| - 3(5)$

35. $4 - |-22 + 3(5)| + 2(3)^2$

36. $-|6(16) - 74| + 43$

37. $5|10| - 21$

38. $-\frac{1}{2}|7 - 29| + 11$

39. $-\frac{1}{2}|29 - 7| + 11$

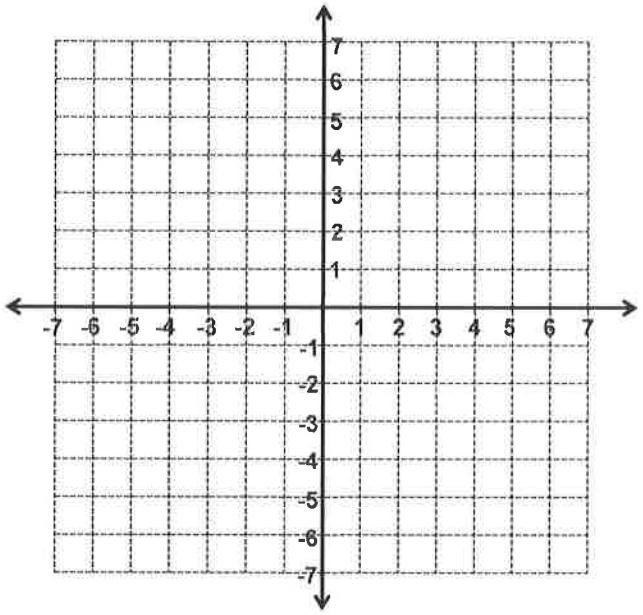
Section 7: Coordinate Plane

https://www.youtube.com/watch?v=r16l6LB2YbQ

40. Label the four quadrants on the coordinate graph below.

41. Plot the four points below on the coordinate graph.

A: $(3, 0)$
B: $(-4, -5)$
C: $(5, -2)$
D: $(0, 5)$
E: $(6, 2)$
F: $(-3, 4)$



Section 8: Manipulating Equations

Simplify the expressions by combining like terms.

42. $3x + 5 + 7x - 2x$

43. $3(x - 7) + 2(5 + x)$

Identify if the value, or point, is a solution to the given equation.

https://www.youtube.com/watch?v=oYYoQvgGcMg

44. Is $x = 3$ a solution to the equation $5x - 7 = 8$?

44. Is $x = -2$ a solution to the equation $3(x + 9) = 20$?

45. Is $x = 36$ a solution to the equation $\frac{x}{3} + 5 = 17$?

46. Is the point $(4,1)$ a solution to the equation $y = 2x - 9$?

47. Is the point $(-2,8)$ a solution to the equation $6x - 2y = 28$?

48. Is the point $(10, 11)$ a solution to the equation $3y = \frac{1}{2}x + 28$?

Solve each equation. Check your solution in the original equation.
https://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/equations_beginner/v/equations-2

49. $x + 3 = 1$

50. $2x - 3 = 5$

51. $\frac{1}{3}x = 4$

52. $\frac{3}{4}x + 9 = 0$

53. $\frac{x}{4} = \frac{1}{2}$

54. $\frac{x}{5} - 12 = -10$

55. $x + 3.5 = 12.5$

56. $5x = 75$

Solve each proportion.
https://www.youtube.com/watch?v=VgSl_YzTXlU

57. $\frac{25}{x} = \frac{5}{2}$

58. $\frac{x}{7} = \frac{75}{100}$

Section 9: Ratios, Rates & Percents

Convert the given amount to the given unit.

https://www.youtube.com/watch?v=4B6GgZNTOAc

59. 7 days = _____ sec

60. 14 gal/sec = _____ qt/min (1 gallon = 4 quarts)

Compare using unit rates.

61. A 30 pack of juice boxes costs $6.17. At that rate, how much would 1 juice box cost?

62. It costs $28.99 for a 12 pack of paper towels at store A. At store B, a 15 pack of the same paper towels costs $34.99. Which is the better deal?

Complete the table by converting the given value into a decimal, percent, or fraction.

Decimal	Percent	Fraction
63. 0.18		
64.		$\frac{15}{20}$
65.	132%	

Sections 10: Proportions

Solve each proportion.

https://www.youtube.com/watch?v=VgSl_YzTXlU

Find each percent by setting up a proportion or equation and solving algebraically.

66. What percent of 42 is 28?

67. What is 2.75% of 20?