May 2023

UPPER SCHOOL SUMMER MATH
Rising 8th Grade
Algebra I Continuation Readiness Packet

Dear Upper School Students,

This summer, we encourage you to continue to foster a belief in the importance and enjoyment of mathematics at home. Being actively involved in mathematical activities enhances learning.

In preparation for the 2023-2024 school year, each student in middle school is required to complete a summer math review packet. Each packet focuses on the prerequisite concepts and skills necessary for student success in each math class. The topics within this packet are important foundational concepts. READ THE INSTRUCTIONS. Even if it doesn't say "Show Your Work" at the top of the page, **you are expected to show your work on all pages.** If you need extra space, you must use and attach scratch paper to the back of the packet.

Please bring your completed math packet (with scratch work attached) with you on the first day of school in August. Your math teachers will be collecting them, and the packets will be graded for timeliness and thoroughness of completion.

Have a wonderful summer!

The Middle School Mathematics Department

NAME _____ DATE _____

Rising 8th, Summer Math Packet: Cumulative Review #1

(Glencoe, Algebra I, Chapter 1)

You are REQUIRED to SHOW YOUR WORK on scratch paper!

1. Write an algebraic expression to represent the number of pens that can be bought with 30 cents if each pen costs c cents. (Lesson 1-1)

A $30 - c$ **B** $\frac{30}{c}$ **C** $30 + c$ **D** $30c$

1. Ⓐ Ⓑ Ⓒ Ⓓ

2. Evaluate $\frac{7a + b}{b + c}$ if $a = 2$, $b = 6$, and $c = 4$. (Lesson 1-2)

F $3\frac{1}{3}$ **G** $1\frac{1}{2}$ **H** 3 **J** 2

2. Ⓕ Ⓖ Ⓗ Ⓙ

3. The measurements of a box are 3.25, 1.4, and 2.1 cm. The measure of the volume is given by the product 9.555. The volume should be rounded to which number? (Lesson 1-5)

A 10 cm^3 **B** 9.6 cm^3 **C** 9.56 cm^3 **D** 9.5 cm^3

3. Ⓐ Ⓑ Ⓒ Ⓓ

4. The equation $4 + 9 = 4 + 9$ is an example of which property of equality? (Lesson 1-3)

F Substitution **G** Reflexive **H** Symmetric **J** Transitive

4. Ⓕ Ⓖ Ⓗ Ⓙ

5. Simplify $7x^2 + 5x + 4x$. (Lesson 1-4)

A $7x^2 + 9x$ **B** $16x^4$ **C** $12x^3 + 4x$ **D** $7x^2 + x$

5. Ⓐ Ⓑ Ⓒ Ⓓ

6. Simplify $7(2x + y) + 6(x + 5y)$. (Lesson 1-4)

F $20x + 37y$ **G** $20x + 6y$ **H** $13x + 42y$ **J** $15x + 6y$

6. Ⓕ Ⓖ Ⓗ Ⓙ

7. Which of the following relations is a function? (Lesson 1-7)

A {(–3, 1), (0, 1), (2, 5)}
B {(–2, –2), (0, 0), (0, –2)}
C {(2, –3), (2, 0), (2, 5)}
D {(1, –3), (0, –1), (3, 2), (1, 0)}

7. Ⓐ Ⓑ Ⓒ Ⓓ

8. What is the range of the relation described by {(–2, 3), (–1, 0), (–2, 5), (–1, –3)}? (Lesson 1-6)

F {all real numbers}
G {–1}
H {–2, –1}
J {–3, 0, 3, 5}

8. Ⓕ Ⓖ Ⓗ Ⓙ

9. The distance an airplane travels increases as the duration of the flight increases. Identify the dependent variable. (Lesson 1-6)

A time **B** direction **C** airplane **D** distance

9. Ⓐ Ⓑ Ⓒ Ⓓ

10. Omari drives a car that gets 18 miles per gallon of gasoline. The car's gasoline tank holds 15 gallons. The distance Omari drives before refueling is a function of the number of gallons of gasoline in the tank. Identify a reasonable domain for this situation. (Lesson 1-6)

F 0 to 18 miles
G 0 to 15 gallons
H 0 to 270 miles
J 0 to 60 mph

10. Ⓕ Ⓖ Ⓗ Ⓙ

NAME _____ DATE _____

Summer Math Packet: Cumulative Review #1 (continued)

11. Evaluate $x^2 + y^2 + z$, if $x = 7$, $y = 6$, and $z = 4$. (Lesson 1-2)

A 17 **B** 101 **C** 89 **D** 59

11. Ⓐ Ⓑ Ⓒ Ⓓ

12. Which is a good estimate for the distance from Boston, MA to Miami, FL? (Lesson 1-5)

F 1,200 inches **G** 1,200 feet **H** 1,200 yards **J** 1,200 miles

12. Ⓕ Ⓖ Ⓗ Ⓙ

13. Using the Distributive Property to find $9\left(5\frac{2}{3}\right)$ would give which expression? (Lesson 1-4)

A $9(5) + \frac{2}{3}$ **B** $9\left(\frac{17}{3}\right)$ **C** $9(5) + 9\left(\frac{2}{3}\right)$ **D** $9(5)\left(\frac{2}{3}\right)$

13. Ⓐ Ⓑ Ⓒ Ⓓ

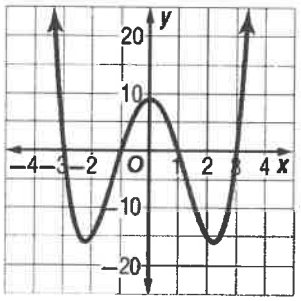
14. Which sentence best describes the end behavior of the function shown? (Lesson 1-8)

F As x increases, y decreases, and as x decreases, y decreases.

G As x increases, y increases, and as x decreases, y decreases.

H As x increases, y decreases, and as x decreases, y increases.

J As x increases, y increases, and as x decreases, y increases.



14. Ⓕ Ⓖ Ⓗ Ⓙ

15. If $g(x) = x^2 + 5$, find $g(3)$. (Lesson 1-7)

A 8 **B** 9 **C** 11 **D** 14

15. Ⓐ Ⓑ Ⓒ Ⓓ

NAME _____ DATE _____

Summer Math Packet: Cumulative Review #1 (continued)

Find each product or quotient.
(Prerequisite Skill)

16. $17 \cdot 8$

17. $84 \div 7$

18. $0.9 \cdot 5.6$

19. $\frac{8}{9} \div \frac{16}{3}$

20. Write an algebraic expression for *six less than twice a number*. (Lesson 1-1)

21. Write a verbal expression for $4m^2 + 2$. (Lesson 1-1)

22. Evaluate $13 - \frac{1}{3}(11 - 5)$. (Lesson 1-2)

23. Evaluate $\frac{2b + c^2}{a}$, if $a = 2$, $b = 4$, and $c = 6$. (Lesson 1-2)

24. Evaluate $3(5 \cdot 2 - 9) + 2 \cdot \frac{1}{2}$. (Lesson 1-2)

25. Evaluate $\frac{1}{3} \cdot 20 \cdot 6 \cdot \frac{1}{5}$ using the properties of numbers. (Lesson 1-3)

Simplify each expression.

26. $7n + 4n$
(Lesson 1-4)

27. $5y + 3(2y + 1)$
(Lesson 1-4)

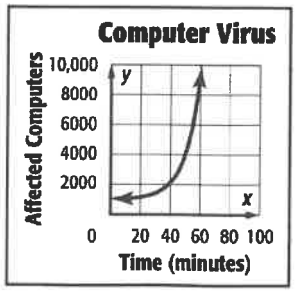
28. Find Jada's debt-to-income ratio if her monthly expenses are \$1850 and her monthly salary is \$2500. (Lesson 1-5)

29. Alvin is mowing his front lawn. His mailbox is on the edge of the lawn. Draw a reasonable graph that shows the distance Alvin is from the mailbox as he mows. Let the horizontal axis show the time and the vertical axis show the distance from the mailbox. (Lesson 1-6)

30. Identify and interpret each feature of the graph shown. (Lesson 1-8)

a. intercept(s)

b. end behavior



16. _____

17. _____

18. _____

19. _____

20. _____

21. _____

22. _____

23. _____

24. _____

25. _____

26. _____

27. _____

28. _____

29. _____

30a. _____

30b. _____

NAME _____ DATE _____

Rising 8th, Summer Math Packet: Cumulative Review #2

(Glencoe, Algebra I, Chapters 1 and 2)

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31. Write an algebraic expression for the following verbal expression *the sum of n and 5.* (Lesson 1-1)

A $5n$ **B** $\frac{n}{5}$ **C** $n+5$ **D** $n-5$

31. Ⓐ Ⓑ Ⓒ Ⓓ

32. Determine which of the following relations is a function. (Lesson 1-7)

F {(–4, 3), (–2, –2), (0, 2), (0, 5)}
G {(–3, 1), (–3, 3), (–2, –1), (0, 5)}
H {(–4, –1), (–2, –1), (–1, –1), (3, 3)}
J {(2, –5), {–1, –1), (0, 4), (2, –3)}

32. Ⓕ Ⓖ Ⓗ Ⓙ

33. Simplify the expression $7(x-y)-2(y-x)+4x$. (Lesson 1-4)

A $13x-9y$ **B** $9x-5y$ **C** $9x-9y$ **D** $13x-5y$

33. Ⓐ Ⓑ Ⓒ Ⓓ

34. Evaluate $a(b-c^2)$ if $a=\frac{2}{3}$, $b=\frac{3}{4}$, and $c=\frac{1}{2}$. (Lesson 1-2)

F $\frac{1}{65}$ **G** $\frac{1}{3}$ **H** $\frac{1}{4}$ **J** $\frac{2}{3}$

34. Ⓕ Ⓖ Ⓗ Ⓙ

35. Solve the proportion $\frac{a}{25}=\frac{9}{45}$. (Lesson 2-6)

A 7.8 **B** 16.2 **C** 125 **D** 5

35. Ⓐ Ⓑ Ⓒ Ⓓ

36. Evaluate the expression $|2x-3y|+5z$ if $x=-3$, $y=4$, and $z=-1$. (Lesson 2-5)

F 23 **G** 13 **H** –13 **J** –23

36. Ⓕ Ⓖ Ⓗ Ⓙ

37. Solve $-\frac{3}{4}y=\frac{8}{20}$. (Lesson 2-2)

A $\frac{2}{5}$ **B** $-\frac{3}{10}$ **C** $\frac{8}{15}$ **D** $-\frac{8}{15}$

37. Ⓐ Ⓑ Ⓒ Ⓓ

38. Which equation has a solution of –2? (Lesson 2-3)

F $4n+3=11$ **H** $5(1+n)=-5$
G $4=3n-2$ **J** $3(n+1)=2$

38. Ⓕ Ⓖ Ⓗ Ⓙ

39. Find Juan's debt to income ratio if his monthly expenses are $900 and his monthly salary is $1200. (Lesson 1-5)

A 0.33 **B** 0.75 **C** 0.9 **D** 1.2

39. Ⓐ Ⓑ Ⓒ Ⓓ

NAME _____

Summer Math Packet: Cumulative Review #2 (continued)

40. Translate the following sentence into an equation.
The quotient of 24 and x equals 14 minus 2 times x. (Lesson 2-1)

F $24x = 14 - 2x$ **H** $\frac{24}{x} = 14 - 2x$

G $24x = 2x - 14$ **J** $\frac{24}{x} = 2x - 14$

40. Ⓕ Ⓖ Ⓗ Ⓙ

41. Evaluate 2^6. (Lesson 1-2)
A 12 **B** 32 **C** 64 **D** 128

41. Ⓐ Ⓑ Ⓒ Ⓓ

42. Which pair of ratios forms a proportion? (Lesson 2-6)
F $\frac{2}{3}$ and $\frac{4}{9}$ **G** $\frac{5}{15}$ and $\frac{4}{12}$ **H** $\frac{4}{12}$ and $\frac{6}{24}$ **J** $\frac{1}{9}$ and $\frac{9}{10}$

42. Ⓕ Ⓖ Ⓗ Ⓙ

43. Evaluate $14 - \left(\frac{1}{4}\right)(17 - 5)$. (Lesson 1-2)
A 17 **B** 34 **C** 11 **D** 120

43. Ⓐ Ⓑ Ⓒ Ⓓ

44. Evaluate $21 \div 3 + 4 \cdot 2$. (Lesson 1-2)
F 15 **G** 22 **H** 1.9 **J** 9

44. Ⓕ Ⓖ Ⓗ Ⓙ

NAME _____ DATE _____

Summer Math Packet: Cumulative Review #2 (continued)

45. Evaluate $3y - x^2z$ if $x = 2$, $y = 14$, and $z = 5$. (Lesson 1-2)

46. Simplify $2(u + 3x) + 3(u + x)$. (Lesson 1-3)

47. Miguel was riding his bike to school. He got halfway there and realized he had forgotten his backpack. He turned around, went home, retrieved his backpack, and continued his ride to school. Sketch a reasonabl graph to show his distance from school from the time he started to the time he arrived at school. Assume his rate is always the same. (Lesson 1-6)

48. Translate the following sentence into an algebraic equation.
Nine times a number y subtracted from 85 is seven times the sum of four an
(Lesson 2-1)

49. Solve the following problem by working backward. Three is added to a nur The result is divided by two, and then the new result is added to eighteen. The final result is 35. What is the number? (Lesson 2-3)

For Questions 50-52, solve each equation. (Lessons 2-2 through 2-4)

50. $-27 = -6 - 3p$

51. $7a + 2 = 3a - 10$

52. $2(x - 3) + 6x = 3(9 - x)$

53. Solve $t = \frac{m}{x} + p$ for m. (Lesson 2-7)

54. If Ethan's monthly expenses are \$1160 and his debt to income ratio is 0.8, what is his monthly salary? (Lesson 1-5)

55. A refrigerator should be set at 38°F with an allowance for 2°. (Lesson 2-5)

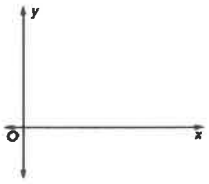
a. Write an equation to find the maximum and minimum temperatures at which the refrigerator should be set.

b. Solve the equation to find the maximum and minimum temperatures at which the refrigerator should be set

45. _____

46. _____

47. _____



48. _____

49. _____

50. _____

51. _____

52. _____

53. _____

54. _____

55a. _____

55b. _____

NAME _____ DATE _____

Rising 8th, Summer Math Packet: Cumulative Review #3

(Glencoe, Algebra I, Chapters 1 - 3)

You are REQUIRED to SHOW YOUR WORK on scratch paper!

56. Find the solution of $y + \frac{2}{3} = \frac{22}{15}$ if the replacement set is $\frac{2}{5}, \frac{3}{5}, \frac{4}{5}, 1, 1\frac{1}{5}$. (Lesson 1-5)

56. _____

57. Simplify $5m + 8p + 3m + p$. (Lesson 1-3)

57. _____

58. Determine the slope of the line passing through (1, 4) and (3, –1). (Lesson 3-3)

58. _____

59. Translate the following equation into a verbal sentence. $\frac{x}{4} - y = -2\left(\frac{x}{y}\right)$ (Lesson 2-1)

59. _____

60. What is the range of $y = |2x - 1|$? (Lesson 3-8)

60. _____

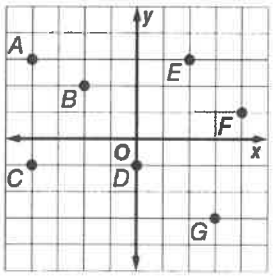
61. Solve $-7x + 23 = 37$. (Lesson 2-3)

61. _____

62. Use cross products to determine whether the ratios $\frac{4}{7}$ and $\frac{11}{15}$ form a proportion. Write *yes* or *no*. (Lesson 2-6)

62. _____

For Questions 63 and 64, use the graph.



63. Express the relation as a set of ordered pairs. Then determine the domain and range. (Lesson 1-6)

63. _____

64. Determine whether the relation is a function. (Lesson 1-7)

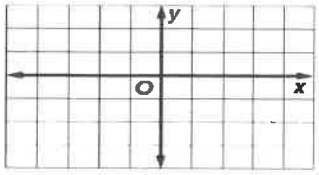
64. _____

65. _____

65. Find the x-intercept of the graph of $4x = 5 + y$. (Lesson 3-1)

66. Graph $2x - 3y = 6$. (Lesson 3-1)

66.



67. Hannah wants to download songs. The total cost to download songs from Site F can be modeled by $f(x) = 0.99s$, where s represents the number of songs downloaded. Site F also charges an $8 annual membership fee.

a. Write a function $g(x)$ that represents the cost of downloading songs from Site F. (Lesson 3-5)

67a. _____

b. Find the cost of downloading 6 songs with and without the membership fee. (Lesson 3-5)

67b. _____