

Name \_\_\_\_\_

## 2018-2019 Algebra I Summer Packet

This packet is required to be turned in on the first Friday of School.

### Order of Operations

1)  $14 \div 7 + 3^2$       2)  $42 \div 2(-12 + 9)$       3)  $\sqrt{49}$       4)  $|-14|$

5)  $18 - 30 \div 5$       6)  $48 \div (5 + 7) - 9$       7)  $4^3 - 5(2) + 13$

### Adding/Subtracting/Multiplying/Dividing Positive and Negative Numbers

8)  $-2 + 11 - 7$       9)  $5 - 3 + 12 - (-9)$       10)  $\frac{-4}{\left(\frac{3}{4}\right)}$

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

14)  $\frac{3}{4} + \frac{1}{6}$       15)  $2\frac{1}{3} - \frac{7}{9}$       16)  $\left(\frac{2}{3}\right) \div \left(1\frac{5}{9}\right)$

### Evaluating Expressions

17)  $3(n - 1) + 2n$ , when  $n = 5$

18)  $7b - 2a$ , when  $a = -3$  and  $b = 4$

19)  $3x^2 + 5x + 1$ , when  $x = -2$

20)  $\frac{2r}{t} + 7$ , when  $r = 12$  and  $t = 3$

21)  $(3x)^2 - 7y^2$ , when  $x = 3$  and  $y = 2$

22)  $4(3d + 6) - 2d$ , when  $d = -6$

**Solving Equations**

Here is an example:

|  |  |
|--|--|
| $3b + 2 = 6(3 - b)$ $3b + 2 = 18 - 6b$ $\begin{array}{r} -2 \quad -2 \\ \hline 3b = 16 - 6b \\ +6b \quad +6b \\ \hline 9b = 16 \\ \frac{9b}{9} = \frac{16}{9} \\ b = \frac{16}{9} \end{array}$ | <p style="text-align: center;"><b>Check:</b></p> <p>Does <math>3\left(\frac{16}{9}\right) + 2 = 6\left(3 - \left(\frac{16}{9}\right)\right)</math>?</p> $\frac{16}{3} + 2 = 6\left(\frac{11}{9}\right)$ $\frac{16}{3} + \frac{6}{3} = \frac{22}{3}$ $\frac{22}{3} = \frac{22}{3} \checkmark$ |
|--|--|

**Solve the equation. Include a check**

23)  $14 = b + 5$

24)  $5r = 22$

25)  $\frac{x}{4} = -9$

26)  $3x - 5 = 13$

27)  $\frac{1}{4}d + 2 = 3$

28)  $-21 - 5x = 64$

29)  $3y + 2y = 81 - 6$

30)  $18y - 21 = 15y + 3$

31)  $\frac{2a}{7} = \frac{2}{3}$

32)  $2x - 10 + 2 = 12$

33)  $3(y - 4) = -2y - 12$

34)  $\frac{4x}{7} = \frac{6}{5}$

**Properties**

Match each equation on the left with the property it illustrates on the right.

35)  $4 + (9 + 6) = (4 + 9) + 6$

A. Identity Property of Addition

36)  $x + 12 = 12 + x$

B. Associative Property

37)  $(3 + y) + 0 = 3 + y$

C. Distributive Property

38)  $x \cdot 1 = x$

D. Identity Property of Multiplication

39)  $5(x + y) = 5x + 5y$

E. Commutative Property

### Distributive Property

Simplify each expression using the distributive property.

Example:  $4(x + 5) = 4(x) + 4(5) = 4x + 20$

40)  $3(b + 9)$

41)  $5(2x - 3)$

42)  $-3(4x + 9)$

43)  $x(2x + 4)$

44)  $\frac{1}{2}(4r + 12)$

45)  $-(6p - 11)$

### Subsets of Real Numbers and Number Sense

46) List all the perfect squares between 1 and 250

47) What is the smallest prime number? The smallest composite number?

48) List 4 factors of 24. List 4 multiples of 24.

49) Are both 7 and  $-\frac{1}{2}$  integers? Why or why not?

50) Are both 7 and  $-\frac{1}{2}$  rational numbers? Why or why not?

51) Round 43.77301 to the nearest hundredth.

52) Round -5.1982569 to the nearest hundredth.

### Simplifying Expressions

**Simplify each expression by distributing and combining like terms.**

53)  $4x + 7y - 14x + 2y$

54)  $-13 - 4y - 5z + 15 - (-4z) + 11y$

55)  $20xy + 3x^2y - 10x^2y - 30xy$

56)  $-3(2x - 5y)$

57)  $9(6 + 2y) - 5 + 2y$

58)  $2(3x - 1) + 3(x + 7)$

59)  $9(2x + 4) - 2(3x - 1)$

### Translating Expressions and Equations

Write an algebraic expression or equation to represent each verbal expression.

**Example:** 18 less than the quotient of a number and 3.  $\rightarrow \frac{n}{3} - 18$

- 60) The sum of six times a number and 25
- 61) 7 less than fifteen times a number
- 63) Four times the square of a number increased by five times the same number
- 64) The sum of a number and 23 is 78.
- 65) The sides of a rectangle are a number and 4 less than that same numbers. The perimeter is 56. Find the dimensions of the rectangle.
- 66) If a number is decreased by 6, and the result is multiplied by 3, than the answer is 15. Find the unknown number.

### Consecutive Number Problems

Include a let statements and checks for each problem.

- 67) The sum of two consecutive integers is 61.
- 68) The sum of three consecutive even integers is 144.
- 69) Find two consecutive odd whole numbers whose sum is 2 less than 6 times the first number.

### Word Problems

Write an equation to mode each word problem. Include let statements and checks for each problem.

- 70) Joelle had \$24 to spend on seven pencils. After buying them she had \$10. How much did

each pencil cost?

*Example:*

Let  $x$  = cost per pencil

$$7x + 10 = 24$$

$$\quad -10 \quad -10$$

$$\frac{7x}{7} = \frac{14}{7}$$

$$x = 2$$

Check:

$$\text{Does } 7(2) + 10 = 24?$$

$$14 + 10 = 24$$

$$24 = 24 \quad \square$$

Each pencil cost 2 dollars.

73) 331 students went on a field trip. Six buses were filled and 7 students traveled in cars. How many students were in each bus?

71) Marla bought seven boxes. A week later half of all her boxes were destroyed in a fire. There are now only 22 boxes left. With how many did she start?

74) You bought a magazine for \$5 and four erasers. You spent a total of \$25. How much did each eraser cost?

72) Coral spent half of her weekly allowance playing mini-golf. To earn more money her parents let her wash the car for \$4. What is her weekly allowance if she ended with \$12?

75) Jacki won 40 super bouncy balls playing horseshoes at her school's game night. Later, she gave two to each of her friends. She only has 8 remaining. How many friends does she have?

### Radicals

76.  $\sqrt{1000x^3}$

77.  $\sqrt{20xy^2}$

78.  $-\sqrt{144a^2}$

79.  $\sqrt{27a^2}$

80.  $3\sqrt{3} + 9\sqrt{3} - 4\sqrt{3}$

81.  $2\sqrt{5} - 2\sqrt{36} + 3\sqrt{45}$

82.  $8\sqrt{7} - 9\sqrt{7}$

83.  $3\sqrt{11} + 2\sqrt{44} + \sqrt{11}$

**Pythagorean Theorem**

84. A ladder is leaning against the side of a 10m house. If the base of the ladder is 3m away from the house, how tall is the ladder? Round your answer to the nearest hundredth. **Please draw a diagram and show all work.**

85. A baseball diamond is a square with sides of 90 feet. What is the shortest distance, to the *nearest tenth* of a foot, between first base and third base? **Please draw a diagram and show all work.**

**Simplify.**

1)  $(n^4)^{\frac{3}{2}}$

2)  $(27p^6)^{\frac{5}{3}}$

3)  $(25b^6)^{-1.5}$

4)  $(64m^4)^{\frac{3}{2}}$

5)  $(a^8)^{\frac{3}{2}}$

6)  $(9r^4)^{0.5}$

7)  $(81x^{12})^{1.25}$

8)  $(216r^9)^{\frac{1}{3}}$

13) 
$$\frac{2x^{-\frac{7}{4}}}{4x^{\frac{4}{3}}}$$

14) 
$$\frac{4x^2}{2x^{\frac{1}{2}}}$$

15) 
$$\frac{3x^{-\frac{1}{2}} \cdot 3x^{\frac{1}{2}} y^{-\frac{1}{3}}}{3y^{-\frac{7}{4}}}$$

16) 
$$\frac{3y^{\frac{1}{4}}}{4x^{-\frac{2}{3}} y^{\frac{3}{2}} \cdot 3y^{\frac{1}{2}}}$$

17) 
$$\left(m \cdot m^{-2} n^{\frac{5}{3}}\right)^2$$

18) 
$$\left(a^{-1} b^{\frac{1}{3}} \cdot a^{-\frac{4}{3}} b^2\right)^2$$

19) 
$$\left(\frac{x^{\frac{1}{2}} y^{-2}}{yx^{-\frac{7}{4}}}\right)^4$$

20) 
$$\frac{(x^3 y^2)^{\frac{3}{2}}}{\left(x^{-1} y^{-\frac{2}{3}}\right)^{\frac{1}{4}}}$$

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Here are some websites you might find useful in completing your summer assignment.

1. <http://www.regentsprep.org> – use the Math A site
2. <http://www.math.com> – use both Algebra and Pre-Algebra
3. [http:// library.thinkquest.org](http://library.thinkquest.org)
4. [http://www.mathgoodies.com/lessons/toc\\_vol5.html](http://www.mathgoodies.com/lessons/toc_vol5.html) – there are others on here, but this is the integer site
5. [http://www.teacherschoice.com.au/Maths\\_Library/Algebra/Alg\\_1.htm](http://www.teacherschoice.com.au/Maths_Library/Algebra/Alg_1.htm)
6. <http://education.jlab.org/solquiz>
7. [http://w3.fiu.edu/math/cine\\_math/fast/pie.htm](http://w3.fiu.edu/math/cine_math/fast/pie.htm) -- solving equations
8. <http://www.algebrahelp.com/worksheets/>

