

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;">Check:</p> <p>Does $3\left(\frac{16}{9}\right) + 2 = 6\left(3 - \left(\frac{16}{9}\right)\right)$?</p> $\frac{16}{3} + 2 = 6\left(\frac{11}{9}\right)$ $\frac{16}{3} + \frac{6}{3} = \frac{22}{3}$ $\frac{22}{3} = \frac{22}{3} \checkmark$
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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.

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

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

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

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

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

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

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

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

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 – there are others on here, but this is the integer site
5. 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 -- solving equations
8. <http://www.algebrahelp.com/worksheets/>

