

Many of you have requested a summer packet to review skills prior to beginning Algebra I. The problems in this packet are designed to help you review topics from previous mathematics courses that are important to your success in Algebra I.

Have a *WONDERFUL* summer!

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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 $3(\frac{16}{9}) + 2 = 6(3 - (\frac{16}{9}))$?</p> $\frac{16}{3} + 2 = 6(\frac{11}{9})$ $\frac{16}{3} + \frac{6}{3} = \frac{22}{3}$ $\frac{22}{3} = \frac{22}{3} \checkmark$
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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) $4x + 7y - 14x + 2y$

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:

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

$$14 + 10 = 24$$

$$24 = 24$$

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.**

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/>
9. <http://www.math.com/homeworkhelp/Algebra.html>
10. <http://www.math.com/homeworkhelp/PreAlgebra.html>

