

Name \_\_\_\_\_

Date \_\_\_\_\_

Summer Math 2011

Completed Algebra

Every problem from **each** worksheet is to be completed with **all work shown** from the problems on a separate piece of paper or on the front or back of the worksheets. Answers should be written in the corresponding box. These worksheets are due the first day of school in math class. This will be the first quiz grade for the new school year. The grade will be based on completion and the work shown for the problems.

Solutions are included so that your student may check his/her work after completing the problems. Your child may work through the problems until the correct solution is found, being sure to show all of the correct work along with this solution.

**Section 1****Connections to Algebra**

Problems:

Answers:

1.	Evaluate the expression for the given value of the variable. $y - 14$ when $y = 32$	1. $18$
2.	Evaluate the expression for the given value of the variable. $\frac{c}{23}$ when $c = 391$	2. $17$
3.	Evaluate the expression for the given value(s) of the variable(s). $3y^2$ when $y = 5$	3. $75$
4.	Evaluate the expression for the given value(s) of the variable(s). $(c - d)^2$ when $c = 10$ and $d = 3$	4. $49$
5.	Evaluate the expression for the given value of the variable. $(d^4 - 6) \div 5$ when $d = 3$	5. $15$

## Section 2

## Properties of Real Numbers

Problems:

Answers:

1.	Evaluate the expression. $ 8.5 $	1.  8.5
2.	Evaluate the expression. $ -3 $	2.  3
3.	Evaluate the expression. $ -4  + 3$	3.  7
4.	Find the sum. $-3 + 8$	4.  5
5.	Find the sum. $5 + (-7)$	5.  -2
6.	Find the sum. $-4 + 13 + (-6)$	6.  3
7.	Find the sum. $\frac{9}{10} - \frac{1}{2} + (-\frac{1}{5})$	7.  $\frac{1}{5}$
8.	Evaluate the expression. $-8 - 5$	8.  -13
9.	Evaluate the expression. $4.1 - 6.3$	9.  -2.2
10.	Evaluate the expression. $3.6 - 2.4 - (-6.1)$	10.  7.3

11.	Find the sum or difference of the matrices. $\begin{bmatrix} 8 & -4 \\ 9 & 3 \end{bmatrix} + \begin{bmatrix} -2 & 6 \\ -1 & 5 \end{bmatrix}$	11. $\begin{bmatrix} 6 & 2 \\ 8 & 8 \end{bmatrix}$
12.	Simplify the expression. $(-6)(-7)$	12. $42$
13.	Simplify the expression. $(3)(-8)(2)$	13. $48$
14.	Simplify the expression. $(-c)^3(c)$	14. $-c^4$
15.	Use the distributive property to rewrite the expression without parentheses. $6(y + 5)$	15. $6y + 30$
16.	Use the distributive property to rewrite the expression without parentheses. $(x + 3)(-5)$	16. $-5x - 15$
17.	Simplify the expression. $3x + 7x$	17. $10x$
18.	Simplify the expression. $5.4m - 2.3m$	18. $3.1m$
19.	Simplify the expression. $82p - (-29p)$	19. $111p$
20.	Simplify the expression. $2x(7 - x) + 3x^2$	20. $14x + x^2$
21.	Simplify the expression. $18 \div (-2)$	21. $-9$

22.	Simplify the expression. $16 \div \left(-\frac{4}{5}\right)$	22. $-20$
23.	Simplify the expression. $\frac{3x}{8} \div \frac{1}{2}$	23. $\frac{3x}{4}$
24.	Simplify the expression. $21x \div 7$	24. $3x$

### Section 3

### Solving Linear Equations

Problems:

Answers:

1.	Solve the equation. $y - 6 = 8$	1. $y = 14$
2.	Solve the equation. $a - (-6) = 22$	2. $a = 16$
3.	Solve the equation. $ -7  + k = 4$	3. $k = -3$
4.	Solve the equation. $2x - 1 = 11$	4. $x = 6$
5.	Solve the equation. $-x - 5 + 3x = 1$	5. $x = 3$
6.	Solve the equation. $\frac{3}{5}x - 7 = 17$	6. $40$

7.	Solve the equation if possible. $-3(-x - 4) = 2x + 1$	7.  $-11$
8.	Solve the equation if possible. $4\left(\frac{1}{2}x + \frac{1}{2}\right) = 2x + 2$	8.  <i>All real numbers</i>
9.	Solve the equation. Round to the nearest hundredth. $-26x - 59 = 135$	9.  $-7.46$
10.	Solve the equation. Round to the nearest hundredth. $3(3.1x - 4.2) = 6.2x + 3.1$	10.  $5.06$
11.	If you ride your bike for 2.5 hours and travel 37.5 miles, what is your average speed? (Hint: Solve $d = rt$ .)	11.  $15 \text{ mi/h}$
12.	Rewrite the equation so that $y$ is a function of $x$ . Then use the result to find $y$ when $x = -2, -1, 0,$ and $1$ .  $3 - y = x$	12.  $y = -x + 3$ $y = 5, 4, 3, 2$
13.	Find the unit rate. $\$3$ for 5 yogurt snacks.	13.  $\$.60 \text{ per yogurt snack}$
14.	Find the unit rate. Drive 122 miles in 2.5 hours.	14.  $48.8 \text{ m/h}$
15.	Find the percent. Round to the nearest whole percent. Tax of $\$1.00$ on an item priced at $\$19.99$	15.  $5\%$
16.	Find the percent. Round to the nearest whole percent. 9 field goals made out of 14 attempted	16.  $64\%$

## Section 4

## Graphing Linear Equations and Functions

Problems:

Answers:

1.	Find the x-intercept and the y-intercept of the line. $2x - y = 6$	1. $x = 3$ $y = -6$
2.	Find the slope of the line passing through the points. $(6, 1), (-4, 1)$	2. $0$
3.	Find the slope of the line passing through the points. $(-4, 2), (-3, -5)$	3. $-7$
4.	Your earnings vary directly with the number of hours you work. If you earn \$60 for 4 hours of work, how much will you earn for working 35 hours?	4. $\$525$
5.	Write the equation in slope-intercept form. $-3x + 2y = 6$	5. $y = \frac{3}{2}x + 3$
6.	Write the equation in slope-intercept form. $x - 2y + 3 = 0$	6. $y = \frac{1}{2}x + \frac{3}{2}$

## Section 5

## Writing Linear Equations

Problems:

Answers:

1.	Write an equation of the line in slope-intercept form. The slope is -3; the y-intercept is -2	1. $y = -3x - 2$
2.	Write an equation of the line that passes through the point and has the given slope. Write the equation in slope-intercept form. $(5, 2), m = -2$	2. $y = -2x + 12$

3.	Write an equation of the line that passes through the point and has the given slope. Write the equation in slope-intercept form. $(3, 6), m = 0$	3. $y = 6$
4.	Write an equation in slope-intercept form of the line that passes through the points. $(3, -2), (5, 4)$	4. $y = 3x - 11$
5.	Write an equation in slope-intercept form of the line that passes through the points. $(0, 0), (2, 3)$	5. $y = \frac{3}{2}x$
6.	Write the point-slope form of the equation of the line that passes through the point and has the given slope. Then rewrite the equation in slope-intercept form. $(5, 3), m = -2$	6. $y - 3 = -2(x - 5)$ $y = -2x + 13$
7.	Write an equation in standard form of the line that passes through the given point and has the given slope, or that passes through the two points. $(5, -2), m = 3$	7. $3x - y = 17$
8.	Write an equation in standard form of the line that passes through the given point and has the given slope, or that passes through the two points. $(4, -2), (4, 5)$	8. $x = 4$

## Section 6

## Solving and Graphing Linear Inequalities

Problems:

Answers:

1.	Solve the inequality. $x + 5 > -4$	1. $x > -9$
2.	Solve the inequality. $3 \geq y - 4$	2. $y \leq 7$
3.	Solve the inequality. $\frac{3}{4}x + 5 \leq 8$	3. $x \leq 4$

4.	Solve the inequality. $2 \leq x + 4 < 8$	4. $-2 \leq x < 4$
5.	Solve the inequality. $-4x + 1 \geq 17$ or $5x - 4 > 6$	5. $x \leq -4$ or $x > 2$
6.	Solve the inequality. $2x + 1 > 9$ or $3x - 5 < 4$	6. $x > 4$ or $x < 3$
7.	Solve the equation or the inequality. $ 10 + x  = 4$	7. $x = -6, -14$
8.	Solve the equation or the inequality. $ 3x + 4  \leq 2$	8. $-2 \leq x \leq -\frac{2}{3}$

## Section 7 Systems of Linear Equations and Inequalities

Problems:

Answers:

1.	Use the substitution method to solve the linear system. $x + y = 9$ $x - y = 3$	1. $(6, 3)$
2.	Use the linear combinations method to solve the system of linear equations. $2x + 3y = 15$ $3y + 5x = 12$	2. $(-1, \frac{5}{3})$
3.	You pay \$105 for 8 tickets to attend a folk festival. Tickets for students cost \$10 each and tickets for adults cost \$15 each. How many of each type of ticket did you buy?	3. <i>3 student</i> <i>5 adult</i>
4.	Use any method to solve the linear system and tell how many solutions the system has. $x + y = 4$ $2x + 3y = 9$	4. <i>1 solution</i> $(3, 1)$

5.	Use any method to solve the linear system and tell how many solutions the system has. $x + 2y = 5$ $3x - 15 = -6y$	5. <i>infinite</i>
----	--	-----------------------

## Section 8

## Exponents and Exponential Functions

Problems:

Answers:

1.	Simplify, if possible. Write your answer as a power or as a product of powers. $(7^2)(7^3)$	1. $7^5 = 16,807$
2.	Simplify, if possible. Write your answer as a power or as a product of powers. $(12x)^3$	2. $1728x^3$
3.	Simplify, if possible. Write your answer as a power or as a product of powers. $(4r^4s)^2(-2s^2)^3$	3. $-128r^8s^8$
4.	Rewrite the expression with positive exponents. $m^{-4}$	4. $\frac{1}{m^4}$
5.	Rewrite the expression with positive exponents. $(\frac{x}{2})^{-2}$	5. $\frac{4}{x^2}$
6.	Rewrite the expression with positive exponents. $\frac{3}{3x^{-4}y^3}$	6. $\frac{x^4}{y^3}$
7.	Rewrite the expression with positive exponents. $(-3t)^0$	7. $1$
8.	Simplify the expression. The simplified expression should have no negative exponents. $(\frac{3x^2z^4}{2xz})^3$	8. $\frac{27x^3z^9}{8}$

9.	Simplify the expression. The simplified expression should have no negative exponents. $\frac{(rst)^{-2} \cdot (t^2)^3}{rs (s^{-3})^4}$	9. $\frac{s^9 t^4}{r^3}$
10.	Rewrite in decimal form. $4.813 \times 10^{-6}$	10. $.000004813$
11.	Rewrite in decimal form. $3.11 \times 10^4$	11. $31,100$
12.	A principal of \$1100 is deposited in an account that pays 5% interest compounded yearly. Find the total balance after 1 year. (Hint: $I=Prt$ where $P$ is the principal, $r$ is the rate and $t$ is the time.)	12. $\$1155$
13.	A piece of equipment originally costs \$120,000. The value decreases at a rate of 10% per year. Estimate its value after 6 years. (Hint: $y = C(1 - r)^t$ where $C$ is the initial amount, $r$ is the rate and $t$ is the time.)	13. $\$63,773$

## Section 9

## Quadratic Equations and Functions

Problems:

Answers:

1.	Evaluate the expression. Give the exact value if possible. Otherwise, approximate to the nearest hundredth. $-\sqrt{100}$	1. $-10$
2.	Evaluate the expression. Give the exact value if possible. Otherwise, approximate to the nearest hundredth. $\sqrt{676}$	2. $26$
3.	Solve the equation or write no solution. Write the solutions as integers if possible. Otherwise, write them as a radical expression. $4x^2 - 8 = 0$	3. $x = \pm\sqrt{2}$
4.	Solve the equation or write no solution. Write the solutions as integers if possible. Otherwise, write them as a radical expression. $3x^2 - 48 = 0$	4. $x = \pm 4$

5.	Solve the equation or write no solution. Write the solutions as integers if possible. Otherwise, write them as a radical expression. $6x^2 + 6 = 4$	5. <i>No solution</i>
6.	A ball is dropped from a bridge 150 feet above a river. How long will it take for it to hit the river? Use the formula $h = -16t^2 + s$ where $s$ is the initial height.	6. <i>3.06</i>
7.	Simplify the expression. $\sqrt{250}$	9. $5\sqrt{10}$
8.	Simplify the expression. $6\sqrt{8} \cdot 7\sqrt{2}$	10. <i>168</i>
9.	Simplify the expression. $\sqrt{\frac{11}{16}}$	11. $\frac{\sqrt{11}}{4}$
10.	Simplify the expression. $\sqrt{\frac{2}{3}} \cdot \sqrt{\frac{5}{3}}$	12. $\frac{\sqrt{10}}{3}$
11.	Write the quadratic equation in standard form. Solve using the quadratic formula. $2x^2 - 6x = 5$	13. $2x^2 - 6x - 5 = 0$ $\frac{3 \pm \sqrt{19}}{2}$ or $x \approx 3.68$ and $x \approx -.68$
12.	Write the quadratic equation in standard form. Solve using the quadratic formula. $3x^2 + 11x = 4$	14. $3x^2 + 11x - 4 = 0$ $-4, \frac{1}{3}$
13.	Find the discriminant of the equation. Then tell if the equation has two solutions, one solution, or no real solution. $3x^2 + 14x - 5 = 0$	15. <i>256</i> <i>2 solutions</i>

**Section 10****Polynomials and Factoring**

Problems:

Answers:

1.	Use a vertical or a horizontal format to find the sum or the difference. $(7x^2 - 4) + (x^2 + 5)$	1. $8x^2 + 1$
2.	Use a vertical or a horizontal format to find the sum or the difference. $(8x^2 - 3x + 7) + (6x^2 - 4x + 1)$	2. $14x^2 - 7x + 8$
3.	Use a vertical or a horizontal format to find the sum or the difference. $(3x^2 - 2) - (2x - 6x^2)$	3. $9x^2 - 2x - 2$
4.	Use a vertical or a horizontal format to find the sum or the difference. $(5x^2 + 7x - 4) - (4x^2 - 2x)$	4. $x^2 + 9x - 4$
5.	Find the product. $-3x(x^2 + 5x - 5)$	5. $-3x^3 - 15x^2 + 15x$
6.	Find the product. $(t + 9)(2t + 1)$	6. $2t^2 + 19t + 9$
7.	Find the product. $(3x + 4)(5x - 8)$	7. $15x^2 - 4x - 32$
8.	Find the product. $(x + 3)(x^2 - 2x + 6)$	8. $x^3 + x^2 + 18$
9.	Find the product. $(x + 9)^2$	9. $x^2 + 18x + 81$
10.	Find the product. $(a - 2)(a + 2)$	10. $a^2 - 4$

11.	Find the product. $(5p - 6q)^2$	11. $25p^2 - 60pq + 36q^2$
12.	Find the product. $(10x - 5y)(10x + 5y)$	12. $100x^2 - 25y^2$
13.	Solve the equation by factoring. $x^2 + 6x + 9 = 0$	13. $(x + 3)(x + 3) = 0$ $x = -3$
14.	Solve the equation by factoring. $x^2 + 2x - 35 = 0$	14. $(x - 5)(x + 7) = 0$ $x = 5, -7$
15.	Solve the equation by factoring. $x^2 - 12x = -35$	15. $(x - 7)(x - 5) = 0$ $x = 5, 7$
16.	Solve the equation by factoring. $2x^2 + x - 6 = 0$	16. $(2x - 3)(x + 2) = 0$ $-2, \frac{3}{2}$
17.	Solve the equation by factoring. $2x^2 + 7x = -3$	17. $(2x + 1)(x + 3) = 0$ $-3, -\frac{1}{2}$
18.	Factor the expression completely. $x^4 - 9x^2$	18. $x^2(x - 3)(x + 3)$
19.	Factor the expression completely. $m^3 + 11m^2 + 28m$	19. $m(m + 7)(m + 4)$
20.	Factor the expression completely. $x^4 + 4x^3 - 45x^2$	20. $x^2(x + 9)(x - 5)$

21.	Factor the expression completely. $x^3 + 2x^2 - 4x - 8$	21. $(x + 2)(x - 2)(x + 2)$
22.	Factor the expression completely. $x^3 - x^2 + 4x - 4$	22. $(x^2 + 4)(x - 1)$