

Name _____

Date _____

Summer Math 2011
Completed Algebra III

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 the correct answers 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**Function and Inequalities**

Problems:

Answers:

1.	Evaluate the expression. $4 + 7 - 8 \div 4$	1. 9
2.	Evaluate the expression. $8 - (4 + 3)^2 + 5$	2. -36
3.	Evaluate the expression. $x^3 - 5x$ when $x = 3$	3. 12
4.	Simplify the expression. $7x - y + 9x - 2y$	4. $6x - 3y$
5.	Simplify the expression. $2(x - 1) + 3(x + 2)$	5. $5x + 4$
6.	Solve the equation. Check your solution. $5x + 17 = 2x - 10$	6. -9

7.	Solve the equation. Check your solution. $-5(2x - 1) = 3(x + 4)$	7. $-\frac{7}{13}$
8.	Solve the equation for y. $3x + 4y = 12$	8. $y = -\frac{3}{4}x + 3$
9.	Solve the equation for y. $-6y + 7x = -9$	9. $y = \frac{7}{6}x + \frac{3}{2}$
10.	The school band is planning a carnival to raise money. They plan to sell 500 tickets. Adult tickets will be \$4.50 and student tickets will be \$2.50. They need to collect \$1650 in ticket sales to meet their goal. How many adult and student tickets do they need to sell?	10. <i>200 adult 300 student</i>
11.	Solve the inequality. $-m - 3 < 3m + 5$	11. $m > -2$
12.	Solve the inequality. $4 \leq x + 2 \leq 12$	12. $2 \leq x \leq 10$
13.	Solve the inequality. $3x - 7 \leq 16$ or $2x - 1 > 23$	13. $x \leq \frac{23}{3}$ or $x > 12$
14.	Solve the equation. $ 2x - 6 = 50$	14. $28, -22$
15.	Solve the inequality. $ 4 - 8x \geq 100$	15. $x \leq -12$ or $x \geq 13$

Section 2

Linear Equations and Functions

Problems:

Answers:

1.	Evaluate the function when $x = -2$. $f(x) = -x - 48$	1. -46
2.	Evaluate the function when $x = -2$. $F(x) = x + 3 - 9$	2. -8
3.	Tell whether the lines are parallel, perpendicular, or neither. Line 1: through (3, 4) and (1, 6) Line 2: through (-1, 0) and (3, 5)	3. <i>Neither</i>
4.	Draw the line with the slope and the y-intercept. $M = 2, b = -4$	4.
5.	Find the slope and y-intercept of the line. $Y = 2x - 5$	5. $m = 2$ $b = -5$
6.	Find the slope and y-intercept of the line. $-2x + y = 10$	6. $m = 2$ $b = 10$
7.	Write an equation of a line that has the given properties. Slope: 2, y-intercept: -4	7. $y = 2x - 4$
8.	Write an equation of a line that has the given properties. Passes through (2, 6) and (-7, 6)	8. $y = 6$

Section 3

Systems of Linear Equations and Inequalities

Problems:

Answers:

1.	Solve the system using any algebraic method. $3x - 2y = 4$ $-2x + 2y = 3$	1. $(7, \frac{17}{2})$
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2.	Solve the system using any algebraic method. $5x + y = 5$ $9x - 4y = -20$	2. $(0, 5)$
3.	Write the linear equation as a function of x and y. Then evaluate the function for the given values. $3x + 2y + 4z = 12, f(2, 3)$	3. $z = -\frac{3}{4}x - \frac{1}{2}y + 3; 0$
4.	Solve the system using any algebraic method. $3x + 2y = 12$ $2y - 5z = 1$ $X + y + z = 6$	4. $(2, 3, 1)$
5.	You have \$20.75 to spend on picking 15 pounds of three different types of apples in an orchard. The Red Rome apples cost \$1.29 per pound, the Granny Smith apples cost \$1.49 per pound, and the Empire apples cost \$1.09 per pound. You want twice as many Granny Smith apples as the other two kinds combined. How many pounds of each type of apples should you buy?	5. <i>2 lbs. Red Rome Apples</i> <i>10 lbs. Granny Smith Apples</i> <i>3 lbs. Empire Apples</i>

Section 4

Matrices and Determinants

Problems:

Answers:

1.	Perform the indicated operation. $\begin{bmatrix} 3 & 6 \\ -4 & -2 \end{bmatrix} + \begin{bmatrix} 1 & -4 \\ 0 & 6 \end{bmatrix}$	1. $\begin{bmatrix} 4 & 2 \\ -4 & 4 \end{bmatrix}$
2.	Find the product. If it is not defined, state the reason. $\begin{bmatrix} 2 & -6 \\ 3 & 1 \end{bmatrix} \begin{bmatrix} 0 & 4 \\ -1 & -5 \end{bmatrix}$	2. $\begin{bmatrix} 6 & 38 \\ -1 & 7 \end{bmatrix}$
3.	Evaluate the determinant of each matrix. $\begin{bmatrix} 4 & -3 \\ 7 & 2 \end{bmatrix}$	3. -13
4.	Use Cramer's Rule to solve the linear system. $4x + 5y = 30$ $-3x - 3y = -9$	4. $(-15, 18)$

5.	Find the inverse of the matrix. $\begin{bmatrix} -9 & 7 \\ 4 & -3 \end{bmatrix}$	5. $\begin{bmatrix} 3 & 7 \\ 4 & 9 \end{bmatrix}$
6.	Use an inverse matrix to solve the linear system. $6x - 3y = -3$ $-4x + 7y = -3$	6. $(-1, -1)$

Section 5

Quadratic Functions

Problems:

Answers:

1.	Factor the trinomial. If the trinomial cannot be factored, say no. $x^2 + 8x + 15$	1. $(x + 3)(x + 5)$
2.	Factor the trinomial. If the trinomial cannot be factored, say no. $x^2 - 9x + 20$	2. $(x - 5)(x - 4)$
3.	Factor the trinomial. If the trinomial cannot be factored, say no. $3x^2 + 11x - 4$	3. $(3x - 1)(x + 4)$
4.	Factor the trinomial. If the trinomial cannot be factored, say no. $16x^2 - 24x + 9$	4. $(4m - 3)^2$
5.	Factor the trinomial. If the trinomial cannot be factored, say no. $4x^2 - 2x - 20$	5. $2(2x - 5)(x + 2)$
6.	Factor the trinomial. If the trinomial cannot be factored, say no. $3x^2 + 15x - 42$	6. $3(x + 7)(x - 2)$
7.	Solve the equation. $x^2 + 10x + 21 = 0$	7. $-7, -3$

8.	Solve the equation. $3x^2 - 24x - 27 = 0$	8. $9, -1$
9.	Solve the equation. $10x^2 - 3x = -2x^2 + 36$	9. $-1.61, 1.86$
10.	Write the quadratic function in intercept form. $y = x^2 + 10x + 9$	10. $y = (x + 1)(x + 9)$
11.	Simplify the expression. $\sqrt{32}$	11. $\pm 4\sqrt{2}$
12.	Simplify the expression. $\sqrt{243}$	12. $\pm 9\sqrt{3}$
13.	Solve the equation. $-4(x + 2)^2 = -20$	13. $-2 \pm \sqrt{5}$
14.	Solve the equation. $\frac{1}{3}(x - 4)^2 = 3$	14. $7, 1$
15.	Write the expression as a complex number in standard form. $(-6 + 4i) + (2 - 7i)$	15. $-4 - 3i$
16.	Write the expression as a complex number in standard form. $(9 - 2i)(9 + 2i)$	16. 85
17.	Write the expression as a complex number in standard form. $\frac{3}{5 + i}$	17. $\frac{15 - 3i}{26}$

18.	Solve the equation by completing the square. $x^2 - 4x + 8 = 0$	18. $2 \pm 2i$
19.	Use the quadratic formula to solve the equation. $x^2 + 10x + 25 = 0$	19. -5
20.	Use the quadratic formula to solve the equation. $7x^2 - 6x + 10 = 0$	20. $\frac{3 \pm \sqrt{61}i}{7}$
21.	Find the discriminant of the quadratic equation and give the number and type of solutions of the equation. $x^2 + 7x + 12 = 0$	21. 1, 2 real

Section 6

Polynomials and Polynomial Functions

Problems:

Answers:

1.	Evaluate the expression. $(2^3)^3$	1. 512
2.	Evaluate the expression. 6^{-2}	2. $\frac{1}{36}$
3.	Evaluate the expression. $8^0 \cdot 8^{-3}$	3. $\frac{1}{512}$
4.	Simplify the expression. $(32x^2)^4$	4. $1,048,576x^8$
5.	Simplify the expression. $\frac{x^8}{x^5}$	5. x^3

6.	Simplify the expression. $\frac{4x^4y^7}{8x^5y^3}$	6. $\frac{y^4}{2x}$
7.	Use synthetic division to evaluate the polynomial function for the given value. $f(x) = 10x^3 - 5x^2 + 4; x = -1$	7. -11
8.	Find the sum or difference. $(2x^2 + 6x + 3) + (3x^2 + 4x + 4)$	8. $5x^2 + 10x + 7$
9.	Find the sum or difference. $(6x^3 - 7x^4 + 10x) - (4x^3 - 6x^2)$	9. $-7x^4 + 2x^3 + 6x^2 + 10x$
10.	Find the product of the polynomial. $(x - 3)^2$	10. $x^2 - 6x + 9$
11.	Find the product of the polynomial. $(5 - 3x)(x + 1)(x + 6)$	11. $-3x^3 - 16x^2 + 17x + 30$
12.	Find the product of the polynomial. $(x + 12)(2x^2 - 3x + 5)$	12. $2x^3 + 21x^2 - 31x + 60$
13.	Factor the polynomial $x^3 - 27$	13. $(x - 3)(x^2 + 3x + 9)$
14.	Factor the polynomial. $2x^3 + 250$	14. $2(x + 5)(x^2 - 5x + 25)$
15.	Factor the polynomial. $x^3 - x^2 - 14x + 24.$	15. $(x - 2)(x + 4)(x - 3)$

16.	Factor the polynomial. $3x^5 + 6x^3 - 45x$	16. $3x(x^2 + 5)(x^2 - 3)$
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Section 7

Problems:

Answers:

1.	Evaluate the expression. $\sqrt[3]{27}$	1. 3
2.	Evaluate the expression. $16^{-1/2}$	2. $\pm \frac{1}{4}$
3.	Evaluate the expression. $(\sqrt[4]{81})^{-2}$	3. $\pm \frac{1}{9}$
4.	Simplify the expression. $5^{1/4} \cdot 5^{3/4}$	4. 5
5.	Simplify the expression. $(3^{1/3})^{2/5}$	5. $3^{2/15}$
6.	Simplify the expression. $\frac{12^{3/5}}{12^{1/5}}$	6. $12^{2/5}$
7.	Simplify the expression. $\sqrt{25} \cdot \sqrt[3]{25}$	7. $5\sqrt[3]{25}$

8.	Simplify the expression. $\frac{\sqrt{10}}{\sqrt[4]{10}}$	8. $\sqrt[4]{10}$
9.	Simplify the expression. $x^{1/2} \cdot x^{1/5}$	9. $x^{7/10}$
10.	Simplify the expression. $\sqrt[4]{81x^6y^8}$	10. $3xy^2\sqrt{x}$
11.	Let $f(x) = x^2 - 4x + 5$ and $g(x) = x^2 - 9$. Perform the indicated operation. $f(x) + g(x)$	11. $2x^2 - 4x - 4$
12.	Let $f(x) = x^2 - 4x + 5$ and $g(x) = x^2 - 9$. Perform the indicated operation. $g(x) - f(x)$	12. $4x - 14$
13.	Let $f(x) = 3x^{1/3}$ and $g(x) = x^{1/2}$. Perform the indicated operation. $f(x) \cdot g(x)$	13. $3x^{5/6}$
14.	Let $f(x) = 3x^{1/3}$ and $g(x) = x^{1/2}$. Perform the indicated operation. $f(g(x))$	14. $3x^{1/6}$
15.	Find the inverse function. $f(x) = 3x + 1$	15. $y = \frac{x-1}{3}$
16.	Solve the equation. Check for extraneous solutions. $2(x + 1)^{2/3} = 6$	16. $4.2, -6.2$