Chapter 1
Expressions, Equations, and Functions

Key

1. Simplify $6a + 15a$. $21a$
2. Write an algebraic expression for b to the second divided by c to the fourth. $\frac{b^2}{c^4}$
3. State the range of the relation $\{(1, 6), (-2, 3), (5, 7), (5, 9)\}$. $\{3, 6, 7, 9\}$
4. Evaluate $171 \div 3^2 + 4$. $171 \div 9 + 4 = 19 + 4 = 23$
5. Make a table showing the cost of buying 1 to 5 CDs if CDs cost \$12 each.

1	12	4	48
2	24	5	60
3	36		

6. Solve the equation $6(n - 1) + 2 = n(4 + 2) + 4$. $-4 \neq 4$ no solution
7. Write a verbal expression for the algebraic expression $(2 - y) \times 6$. $12 - 6y$
8. Find $f(-11)$ if $f(x) = -3x - 25$. $-3(-11) - 25 = 8$
9. Use the Distributive Property to simplify $11(v - 2)$. $11v - 22$
10. Find the solution of $2(x - 5) = 30$ if the replacement set is $\{19, 20, 21, 22\}$.

$2(20 - 5) = 30$
$2(15) = 30$
$30 = 30$

Chapter 2
Linear Equations

1. Solve the equation $3x + y = 6$ for x. $3x + y = 6$ $\quad \frac{3x}{3} = \frac{6 - y}{3}$ $\quad x = \frac{6 - y}{3}$
2. The formula $A = lw$ finds the area of a rectangle. What is the width of a rectangle whose area is 60 square inches and whose length is 5 inches? $60 = 5x$ $\quad x = 12$
3. Solve $15(s - 3) = 12s - 43$. $3s = 2$ $\quad s = 2/3$
4. A number minus seventeen is negative twelve. Find the number. $n - 17 = -12$ $\quad n = 5$
5. Solve $\frac{1}{3}(45y - 18) = 15(y + 1)$ $15y - 6 = 15y + 15$ no solution.
6. Translate the sentence into a formula. The area of a trapezoid is equal to one-half times the sum of the bases times the height. $A = \frac{1}{2}(b_1 + b_2) \cdot h$
7. Solve $9x - 11 = -56$. $x = 5$
8. Solve $|c - 2| = 10$ $c = 12, \; c = -8$
9. A department store is having a 30% off sale for all clothing items. What is the discount price of a pair of blue jeans that normally cost \$39.99?

$\frac{30}{100} = \frac{x}{39.99}$ $\quad 39.99 - 11.99 = \$20.$

Chapter 3
Linear Functions

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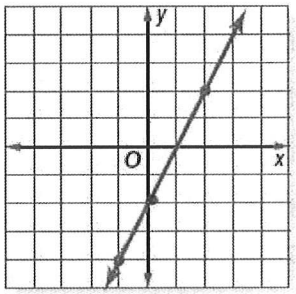
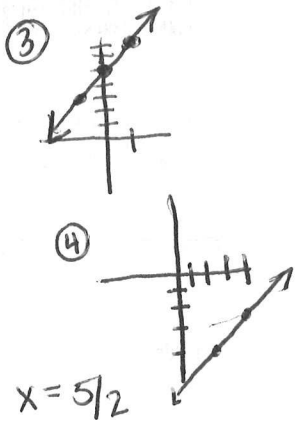
1. Evaluate 3^4. $=81$
2. Graph $y + 2 = 7$. $y=5$
3. Graph $y = 2x + 5$.
4. Graph the line has a slope of ½ and passes through (2, -4)?
5. Solve the equation $3(t+2) - 4=14$ algebraically. $3t=12$ $t=4$
6. Which of the following is the x-intercept of the graph of $2x - y = 5$? $2x-0=5$ $x=5/2$
7. Evaluate: $\frac{x^3 - y^3}{z}$ when $x = 3$, $y = 2$, and $z = 19$. $\frac{27-8}{19}=1$
8. Write an equation in function notation for the relation graphed here



$y=\frac{4}{2}x-2$
$y=2x-2$



Chapter 4
Linear Functions and Relations

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1. Choose the slope-intercept form of the equation of the line that passes through (-2, 4) and is perpendicular to the graph of $2x + y = -20$. $y=-2x-20$ $m=\frac{1}{2}$ $(-2,4)$ $4=\frac{1}{2}(-2)+b$ $4=-1+b$ $5=b$ $y=\frac{1}{2}x+5$
2. Write an equation of a line that passes through (-12, -14) with slope $\frac{5}{6}$. $-14=\frac{5}{6}(-12)+b$ $-14=-10+b$ $-4=b$ $y=\frac{5}{6}x-4$
3. Which equation describes the line that contains the points (-5, 2) and (3, 7)? $m=\frac{5}{8}$ $2=\frac{5}{8}(-5)+b$ $2=-\frac{25}{8}+b$ $b=\frac{41}{8}$ $y=\frac{5}{8}x+\frac{41}{8}$
4. Write the point-slope form of an equation for a horizontal line that passes through (-15, 11). $m=0$ $(-15,11)$ $y-11=0(x+15)$
5. Which equation is the slope-intercept form of the equation of the line that passes through (1, 2) and is parallel to $4x - 2y = 6$? $\frac{-2y}{-2}=\frac{-4x}{-2}+\frac{6}{-2}$ $y=2x-3$ $2=2(1)+b$ $0=b$ $y=2x+0$
6. Write an equation of the line whose slope is $\frac{1}{2}$ and whose y-intercept is -2.

$y=\frac{1}{2}x-2$

Chapter 5
Linear Inequalities

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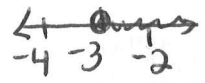
1. Solve and graph the inequality $3x - 4 \geq 2x - 7$ $x \geq -3$ 

2. "Twice a number increased by four is less than the difference of three times that number and five."
$2n+4 < 3n-5$

3. Solve $|8x + 2| < 42$. $8x < 40$ $x < 5$ $8x+2 > -42$ $8x > -44$ $x > -5.5$

4. Graph the inequality of $4x + 3y \geq -15$
$\frac{3y}{3} \geq \frac{-4x}{3} - \frac{15}{3}$

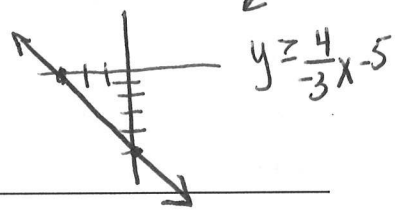
5. Solve $16(t - 1) + 10 > 8(t + 2) + 4(t - 1) + 4t$. no solution

6. Solve and graph $|3x - 6| > 42$. $3x > 48$ $x > 16$ $3x-6 < -42$ $3x < -36$ $x < -12$

7. Solve the inequality $5y + 8 > 4y - 3$. $y > -11$

8. Solve and graph $-4 < -5x - 9 < 11$. $\frac{5}{-5} < \frac{-5x}{-5} < \frac{20}{-5}$ $-1 > x > -4$

9. Solve $-15k > -120$.
$k < 8$



Chapter 6
Systems of Linear Equations and Inequalities

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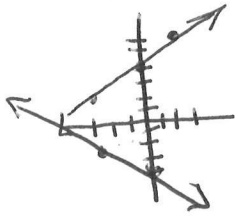
1. If $g(x) = x^2 + 3x - 2$, find $g(-2)$. $g(-2) = 4 - 6 - 2 = -2 - 2 = -4$

2. Graph the system
$y = \frac{2}{3}x + 4$
$y = \frac{2}{-3}x - 4$



3. Use substitution to solve the system $x = \frac{1}{2}y - 4$, $4y - 6x = 12$

$4y - 6(\frac{1}{2}y - 4) = 12$
$4y - 3y + 24 = 12$
$y = -12$

$x = \frac{1}{2}(-12) - 4$
$x = -10$
$(-10, -12)$

4. The sum of two numbers is 36. Twice the first number minus the second is 6. Find the numbers.
14, 22

5. Use elimination to solve the system of equations $5x + 3y = 3$, $3x + 4y = 15$
$x = -3$
$y = 6$

6. Jeanette and Stacy went to the ice cream shop after dinner, but lost their receipt after paying. Jeanette knows she spent \$4.40, and Stacy spent \$5.20. If Jeanette bought 2 scoops of ice cream and 3 pieces of chocolate, and Stacy bought 3 scoops of ice cream and 1 piece of chocolate, how much does each item cost?

\$1.60 ice cream
\$0.40 chocolate

Chapter 7
Polynomials

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1. Simplify $(7a^4b)(8a^7b^6)$. $56a^{11}b^7$

2. Simplify $-\dfrac{12x^4y^{-3}z}{20x^8y^{-5}z^{-2}}$ $-\dfrac{3y^2z^3}{5x^4}$

3. Express 47.5×10^{-5} in scientific notation. .000475

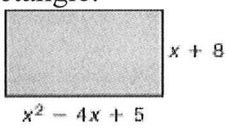
4. Name the polynomial $4x^2 - 3x + 6$. trinomial

5. What is the degree of $6x - 2x^4 + 3x^3 - 2x^2 + 8x - 9$? 4

6. Find $(x + 3)(x - 5)$. $x^2 - 2x - 15$

7. Find $(3a + 4b)^2$ $9a^2 + 24ab + 16b^2$

8. Write an expression for the area of the rectangle.



$x^3 - 4x^2 + 5x$
$+8x^2 - 32x + 40$
$x^3 + 4x^2 - 28x + 40$

9. Simplify $5(2k^2 - 3k) - 6k(-k^2 + k - 7)$. $10k^2 - 15k + 6k^3 - 6k^2 + 42k$
$6k^3 + 4k^2 + 27k$

10. Find $(4x^2 + 3x) + (7x^2 - 5x - 6)$.

$11x^2 - 2x - 6$

Chapter 8
Factoring and Quadratic Equations

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1. Factor by using GCF $14x^2 - 28y^2 + 56$. $14(x^2 - 2y^2 + 4)$

2. Factor $8ac + 12ad + 10bc + 15bd$. (Grouping o rio) $(4a + 5b)(2c + 3d)$

3. Factor $2x^2 + 4x - 12$. $2(x^2 + 2x - 6)$

4. Factor $4y^2 - 9$. $(2y + 3)(2y - 3)$

5. Find the GCF of $14a^2b^4c$ and $56ab^2c^2$ $14ab^2c$

6. Solve $x^2 - x - 72 = 0$. $(x - 9)(x + 8) = 0$ $x = 9$ $x = -8$

7. Factor $12a^2b + 30ab^2$ $2ab(6a + 15b)$

8. Factor $3x^2 - 8x - 3$. $(3x + 1)(x - 3)$

9. Solve the following: $(q + 2)^2 = 25$. $q = 7$ $q = -3$

10. Factor the monomial $32xz^2$ completely. $1 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot x \cdot z \cdot z$
$1 \cdot 2^5 \cdot x \cdot z \cdot z$

Chapter 9
Quadratic and Exponential Functions

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1. Determine if the graph of the equation $y = -x^2 + 6x + 1$ is a minimum or a maximum.

2. How many roots does the equation $9x^2 + 12x - 4$? 2 $12^2 - 4(9)(-4)$ $144 + 144 = 288$

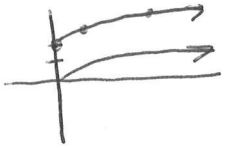
3. Use the quadratic formula to solve $x^2 + 2x - 8 = 0$.
$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$ $x = -4$ $x = 2$

4. Describe how the graph $g(x) = (x+2)^2$ is related to the graph of $f(x) = x^2$.
2 to the left

5. Given $y = 3x^2 - 12x - 5$. Find (a) axis of symmetry (b) vertex (c) min or max (d) y-intercept
(a) = $x = 2$ $(2, -17)$ $(0, -5)$
(e) roots
$-0.38,\ 4.38$

6. Complete a table and graph for $f(x) = \sqrt{x} + 2$. Also graph the parent!

0	2
1	3
4	4



Chapter 10
Radical Functions and Geometry

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1. Simplify $(2+\sqrt{3})^2$. $4 + 4\sqrt{3} + 3 = 7 + 4\sqrt{3}$

2. Simplify $3\sqrt{5} - \sqrt{3} - 2\sqrt{5} + 4\sqrt{3} - \sqrt{5}$. $1\sqrt{5} - 1\sqrt{5} + 3\sqrt{3} = 3\sqrt{3}$

3. Simplify $\frac{3}{4+\sqrt{2}} \cdot \frac{4-\sqrt{2}}{4-\sqrt{2}} = \frac{12-3\sqrt{2}}{16-\sqrt{4}} = \frac{12-3\sqrt{2}}{14}$

4. Simplify $\sqrt{x-4} + 5 = 16$. $x = 125$

5. Simplify $\sqrt{60x^3y^4z}$. $2xy^2\sqrt{15xz}$

6. Simplify $2\sqrt{14} \cdot 3\sqrt{10}$ $6\sqrt{140}$ $6\sqrt{4}\sqrt{35}$ $12\sqrt{35}$

7. Simplify $\sqrt{140}$ $12\sqrt{35}$

Chapter 11
Radical Functions and Equations

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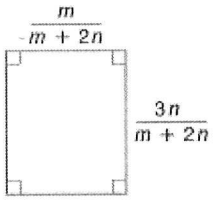
1. State the excluded values of $\frac{x-4}{x^2-5x+6}$ $(x-2)(x-3)=0$ $x=2$ $x=3$

2. Find $\frac{3ab^3}{7a^2b^2}\cdot\frac{21ab}{6b^4}$ $= \frac{63a^2b^4}{42a^2b^6} = \frac{3}{2b^2}$

3. Express $\frac{\frac{-1}{-1}(a)}{(6-a)}+\frac{6}{a-6}$ in simplest form. $\frac{-a+6}{a-6} = -\frac{1(a-6)}{a-6} = -1$

4. Find an expression for the perimeter of the rectangle.



$\frac{2m+6n}{1m+2n}$

5. Solve $\frac{1}{x+3}+\frac{1}{x-4}=\frac{2}{(x+3)(x-4)}$ $x = 3/2 = 1.5$

6. Simplify $\frac{\frac{xy^2}{z^3}}{\frac{x^2}{z}}$ $\frac{y^2}{z^1x^1}$

7. Solve the proportion $\frac{x}{2}=\frac{x+6}{8}$. $8x=2x+12$ $6x=12$ $x=2$

8. Find $\frac{h^2-4h-60}{5}\div\frac{h+6}{h-6}$ $\frac{(h-10)(h-6)}{5}$

9. Find $\frac{3}{a+2}-\frac{2}{a-1}$ $\frac{3a-3-2a-4}{(a+2)(a-1)}$ $\frac{a-7}{(a+2)(a-1)}$

10. If y varies inversely as x and $y = 4$ when $x = ½$, what is y when $x = 3$? 4. $\frac{1}{2} = 3y$ $2 = 3y$ $2/3 = y$

11. Find the zeros of $f(x)=\frac{x-2}{x^2-4x-32}$ $x=2$