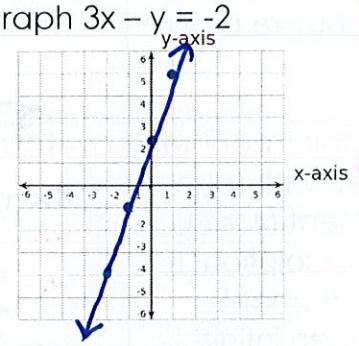
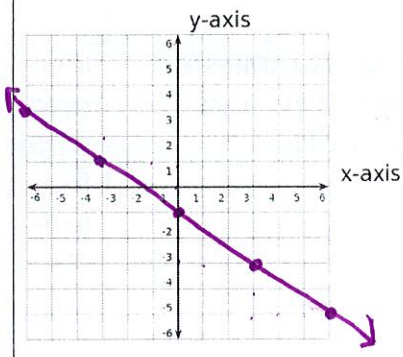
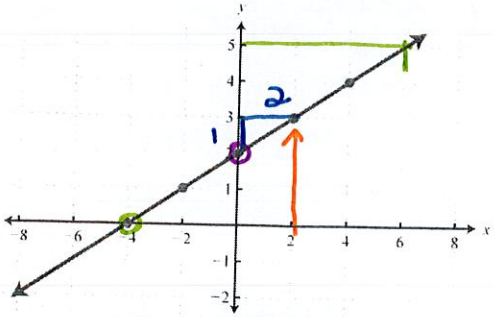
Unit 2a Study Guide
GSE Algebra I

Name: KEY

What you need to know and be able to do	Things to Remember	Problem	Problem
1. Justify steps using properties	Associative prop Commutative prop Symmetric prop Add property of = Subtract prop of = Division prop of = Mult prop of = Distributive prop	$14 = 5x - (2x + 4)$ $14 = 5x - 2x - 4$ $14 = 3x - 4$ $18 = 3x$ $6 = x$ $X = 6$	original problem Distributive Property Assoc. – combine like Add POE Div POE Symmetric POE
2. Solve multi-step equations and inequalities	If variables cancel and left with false statement (4 = 6), then no solution. If true statement (4=6) then infinitely many solutions. Flip the < > sign when multiplying or dividing by a negative	a. $-4(2x - 3) = -6x - 12$ $-8x + 12 = -6x - 12$ $+6x \quad +6x$ $-2x + 12 = -12$ $-12 \quad -12$ $-2x = -24$ $\boxed{x = 12}$ b. $3x + 12 = -4(-6x - 3) + 3x$ $3x + 12 = 24x + 12 + 3x$ $3x + 12 = 27x + 12$ $-3x \quad -3x$ $12 = 24x + 12$ $-12 \quad -12$ $0 = 24x$ $\boxed{x = 0}$	c. $-4x - (2x + 12) > 3x + 6$ $-4x - 2x - 12 > 3x + 6$ $-6x - 12 > 3x + 6$ $+6x \quad +6x$ $-12 > 9x + 6$ $-6 \quad -6$ $-18 > 9x$ $\boxed{x < -2}$ d. $x - 7x - 4 \geq 10$ $-6x - 4 \geq 10$ $+4 \quad +4$ $-6x \geq 14$ $x \leq -\frac{14}{6}$ $\boxed{x \leq -\frac{7}{3}}$
3. Solve literal equations (rearrange formulas)	Isolate the variable Multiply by the denominator when there is a fraction	a. solve for p if $N = \frac{p}{m} \cdot m$ $Nm = p$	b. solve for W if $P = 2(L + W)$ $\frac{P}{2} = \frac{2(L + W)}{2}$ $\frac{P}{2} = L + W$ $-L \quad -L$ $\boxed{\frac{P}{2} - L = W}$
4. Combining functions and function notation	Add: combine like terms Subtract: distribute negative Multiply: add exponents Evaluate: substitute a number for x	$f(x) = x^2 + 3x - 5$ $g(x) = 2x^2 - x + 2$ $h(x) = 3x^3$ a. $f(x) + g(x)$ $x^2 + 3x - 5 + 2x^2 - x + 2$ $\boxed{3x^2 + 2x - 3}$	b. $f(x) - g(x)$ $x^2 + 3x - 5 - (2x^2 - x + 2)$ $x^2 + 3x - 5 - 2x^2 + x - 2$ $\boxed{-x^2 + 4x - 7}$ c. $f(2) + h(2) \rightarrow 5 + 24 = \boxed{29}$ $f(2) = (2)^2 + 3(2) - 5$ $= 4 + 6 - 5$ $= 10 - 5$ $= 5$ $h(2) = 3(2)^3$ $= 3(8)$ $= 24$

5. Arithmetic Sequences	Adding or Subtracting to get to the next term f(n) = dn + z $a_n = a_{n-1} + d$ $a_n = a_1 + d(n-1)$	a. Write the rule for the following sequence and find the 50th term: 3, 6, 9, 12, 15, 18 Specific → Explicit $a_n = 3 + 3(n-1)$ $a_n = 3 + 3n - 3$ $\boxed{a_n = 3n}$ $a_{50} = 3(50) = 150$	b. Write the first 4 term in the sequence: $a_n = -2n + 7 = -2(1) + 7$ $a_1 = 5$, $a_3 = 1$, $a_5 = -3$ $a_2 = 3$ (-2), $a_4 = -1$ c. write an explicit formula for the table: x: 1, 2, 3, 4 y: 2, 5, 8, 11 +3 $a_n = 2 + 3(n-1)$ $a_n = 2 + 3n - 3$ $\boxed{a_n = 3n - 1}$
6. Graph linear functions (lines)	Write equation in slope intercept form by solving for y Y = mx + b b is y-intercept and m is slope (rise over run) vertical lines: x = a number and undefined slope horizontal lines: y = a number and has a slope of zero	graph 3x – y = -2  y=mx+b ← NEEN $3x - y = -2$ $-3x \quad -3x$ $\frac{-y}{-1} = \frac{-3x}{-1} - \frac{2}{-1}$ $\boxed{y = 3x + 2}$	Graph y = -2/3 x -1 
7. solve word problems	Consecutive integer: use x, x + 1, x + 2, etc Consecutive even **AND** odd: use x, x + 2, x + 4, etc Perimeter: draw rectangle and label sides (let x equal shortest side) Average: add all numbers plus x and divide by number you have	a. find 3 consecutive odd integers that add up to 309. Find the integers. $x + x+2 + x+4$ $3x + 6 = 309$ $3x = 303$ $x = 101$ 101, 103, 105 b. find 4 consecutive integers that add up to 130. 31, 32, 33, 34 $x + x+1 + x+2 + x+3$ $4x + 6 = 130$ $4x = 124$ $x = 31$	c. The length of a rectangle is 3 more than twice the width. Find length and width if the perimeter is 48. L = 3 + 2 W $P = 2L + 2W$ $48 = 2(3 + 2W) + 2W$ $48 = 6 + 4W + 2W$ $48 = 6W + 6$ $42 = 6W$ $7 = W$ W = 7u L = 17u d. Bentley buys pokemon cards for $5 a pack with a service charge of $1.50. Write an equation to represent Bentley's spending. $y = 5x + 1.50$ cost per pack initial amt

8. describe characteristics of linear functions	Domain: all x values Range: all y values X intercept: where line crosses x axis; where y = 0 Y intercept: where line crosses y axis; where x = 0 End behavior: As x→∞, f(x) →___ As x→-∞, f(x)→___	 $y = mx + b$ ← Eqn of line: $y = \frac{1}{2}x + 2$ x Domain: $(-\infty, \infty)$ y Range: $(-\infty, \infty)$ y Y intercept: $(0, 2)$ x X intercept: $(-4, 0)$ y $F(\overset{x}{2}) =$ 3 x If f(x) = 5, then x = 6 y End behavior: As x → +∞ y → ∞ As x → -∞ y → -∞

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