NON-GRADED ALGEBRAIC THINKING SELF-ASSESSMENT

(1) Classify these numbers as odd, even, prime, composite, rational, irrational, whole, natural, and integer.

(a) 71

(b) -71

(c) 1/5

(d) 3.14

(e) $3.3333\overline{3}$

(f) $\sqrt{3}$

(g) $\sqrt{9}$

(2) Using the letters a, b, and c, give example of the following properties:

(a) Associative

(b) Commutative

(c) Distributive

(d) Inverse

(e) Identity

(3) Evaluate:

(a) $4x + 7y$ when x = -6 and y = 3

(b) $6x^2 - 2y^2$ when x = 4 and y = 10

(c) $(3x + 7)^2$ when x = 4

Simplify:

(d) $4y - x - y + 6x - x$

(e) $9q + 6p - 7p + q$

(f) $7a - 2b + 3c + 2b + 6a - 8b$

(g) $5(3x - 7y + 6) + 4x - 9$

(h) $-2(6a + 7b) - 3a + 9b$

(i) $4(a + 2b - 3c) + 6a - 7b$

(4) Write each statement in symbols:

(a) eight times the sum of a number and 3

(b) the product of 12 and a number

(c) six subtracted from three times a number

(d) a number divided by six

(e) the sum of a number and 14

(f) one number is 12 more than another number

(g) the sum of 6 times a number and half of another number

(h) the difference of 6 subtracted from a number

(5) Solve:

(a) $9x - 10 = -5 - 2(x + 8)$

(b) $26x - 13 = 65$

(c) $\frac{x}{19} + 11 = 35$

(d) $-3 - 2x = 11$

(e) $-6(x + 6) = 0$

(f) $\frac{x}{18} = 27$

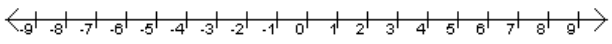
(g) $-9x = 45$

(h) $\frac{x}{6} = -11$

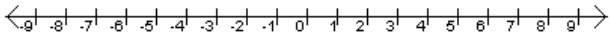
(i) $4(3x + 6) = 6(x + 4)$

(6) Graph the following number ranges:

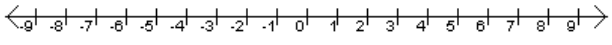
(a) $-3 \leq x \leq 5$



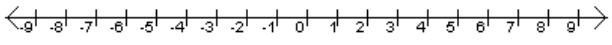
(b) $-2 < x \leq 5$



(c) $-3 \leq x < 0$



(d) $0 < x < 3$



(7) Solve:

(a) $3x - 2 \leq 5x + 3$

(b) $2x + 3 < 8x - 2$

(c) $4(x + 7) \leq 2x + 31$

(d) $7(x - 3) > 5x - 14$

(e) $2x \geq 5x + 18$

(f) $11x + 8 > 4x - 6$

(8) Evaluate:

(a) $|8|$

(b) $|-8|$

(c) $-|-8|$

(d) $|-9| + |4|$

(e) $|9 - 4|$

(f) $|9| - |4|$

(9) Solve for the variable indicated:

(a) $C = 2\pi r, \ \ for\ r$

(b) $V = lwh, \ \ for\ w$

(c) $A = \frac{1}{2}bh, \ \ for\ b$

(d) $I = prt, \ \ for\ p$

(e) $D = rt, \ \ for\ t$

(f) $A = \pi r^2, \ \ for\ r$

(10)

(a) Find three consecutive, even numbers whose sum is 90.

(b) The length of a rectangle is twice its width. If the perimeter of the rectangle is 60 in., find its area.

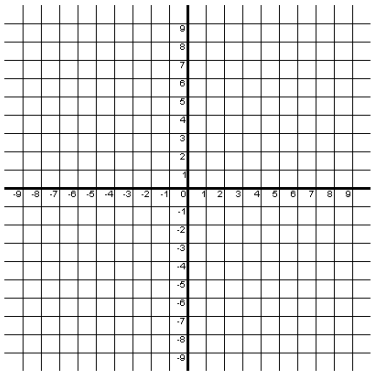
(c) How much of a 16% solution is needed to combine with 34 ml of a 12% solution to make 50 ml of a 15% solution?

(d) A boat can travel 12 mi/hr in still water. If the boat can travel 5 mi downstream in the same time it takes to travel 3 mi upstream, what is the rate of the river's current?

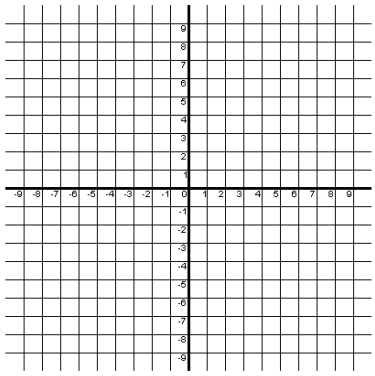
(11) Fill in the table below with all missing information, and then graph the lines on the grids below.

Line	Equation in Standard Form	Equation in Slope-Intercept Form	Slope	x-intercept	y-intercept	A non-intercept point on the line
a			-2			(3, 5)
b				3	-2	
c			$\frac{2}{3}$		1	

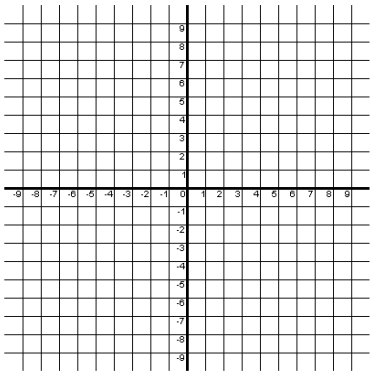
Graph of Line



Graph of Line b



Graph of Line c



(12) Evaluate:

(a) 6^3

(b) $-(3)^2$

(c) $(-3)^2$

(d) $x^2 + x - 1 \ when \ x = 4$

(e) $6x(x-2) + 4 \ when \ x = 3$

(13) Simplify:

(a) $\sqrt{81}$

(b) $\sqrt{150}$

(c) $\sqrt{\frac{4}{9}}$

(d) $-\sqrt{100}$

(e) $\sqrt{756}$

(14) Solve:

(a) by substitution:

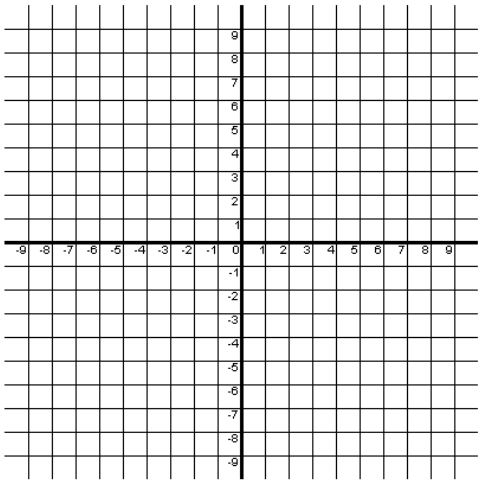
$x - 2y = -4$
$y = x + 1$

(b) by elimination:

$x - 3y = -4$
$2x + y = -1$

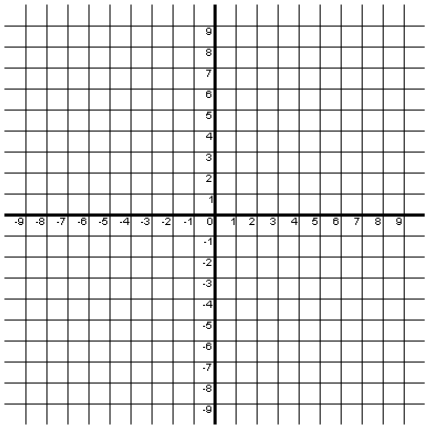
(c) by graphing:

$x - 2y = -4$
$x + y = 5$



(15) Graph the following quadratic equation and specify its vertex:

$$f(x) = x^2 + 2x - 1$$



(16) Factor:

(a) $x^2 + x - 2$

(b) $x^2 - 4$

(c) $6x^2 - 3x - 3$

(17) Is the following graph a function? If so, give its domain and range. Is it a one-to-one correspondence?