Honors Algebra 2

Summer Assignment

Name Key

Period ________ **Date** ________

Ocean Township High School Mathematics Department

These are important topics from Algebra 1 that you must be comfortable doing before you can be successful in Algebra 2.

If you find that you need some assistance, please feel free to Google or YouTube the concepts. Within the directions of each problem, you will see key words that you should be using in your research.

---

1) Solve the linear equation.

$6(x+2)+3(3x-2)=21$

$6x+12+9x-6=21$

$15x+6=21$

$15x=15$

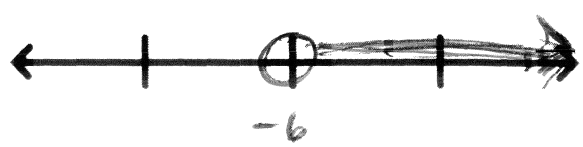
$x=1$

2) Solve the inequality & graph the solution set.

$-6x+4<40$

$-6x<36$

$x>-6$



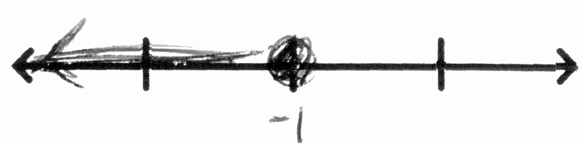
3) Solve the inequality & graph the solution set.

$2(3-x)\geq 8$

$3-x\geq 4$

$-x\geq 1$

$x\leq -1$



4) Solve the absolute value equation.

$|x-7|=11$

$x-7=11$ $\quad$ $x-7=-11$

$+7 \quad +7$ $\quad$ $+7 \quad +7$

$\{-4, 18\}$

5) Solve the absolute value equation.

$3|x-4|+2=20$

$3|x-4|=18$

$|x-4|=6$

$x-4=6 \qquad x-4=-6$

$+4 \quad +4 \qquad +4 \quad +4$

$\{-2, 10\}$

6) Solve the absolute value equation.

$|x+2|-6=-19$

$|x+2|=-13$

$\{\ \}$, no solution

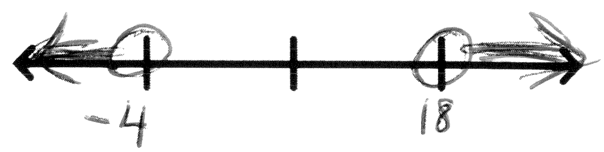
7) Solve the absolute value inequality & graph the solution set.

$|x-7|>11$

$\wedge$

$x-7>11 \qquad x-7<-11$

$x>18 \qquad x<-4$



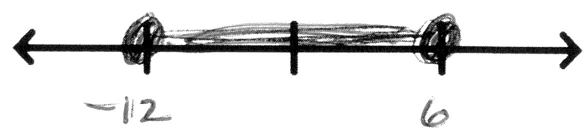
8) Solve the absolute value inequality & graph the solution set.

$|x+3|\le 9$

$\wedge$

$x+3\le 9 \qquad x+3\ge -9$

$x\le 6 \qquad x\ge -12$



$-12\le x\le 6$

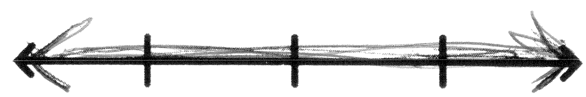
9) Solve the absolute value inequality & graph the solution set.

$|x-3|\ge -13$

$\wedge$

always true

all solutions



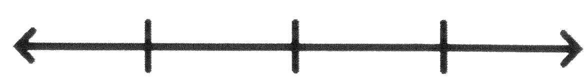
10) Solve the absolute value inequality & graph the solution set.

$|x+2|-6<-19$

$|x+2|<-13$

never true

no solution



empty graph

11) Solve the absolute value inequality & graph the solution set.

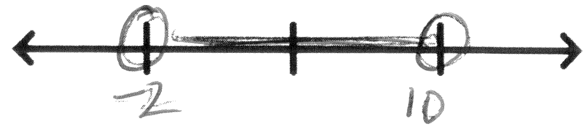
$3|x-4|+2<20$

$3|x-4|<18$

$|x-4|<6$

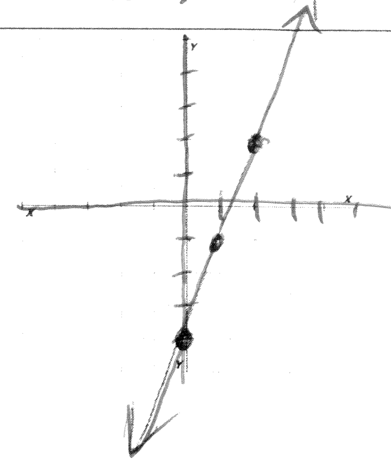
$x-4<6$ $+4$ $\quad x-4>-6$ $+4$

$x<10$ and $x>-2$ $\quad 10<x<-2$



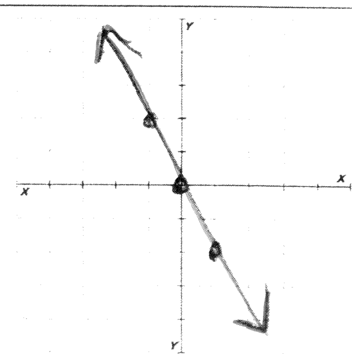
12) Graph the linear equation (slope-intercept form).

$y=3x-4$



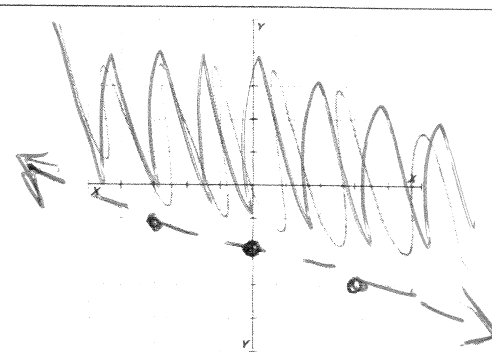
13) Graph the linear equation (slope-intercept form).

$y=-2x$



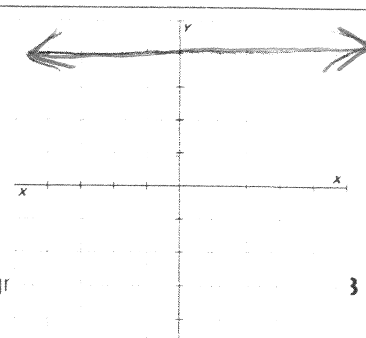
14) Graph the linear inequality (slope-intercept form).

$y>-\frac{1}{3}x-2$



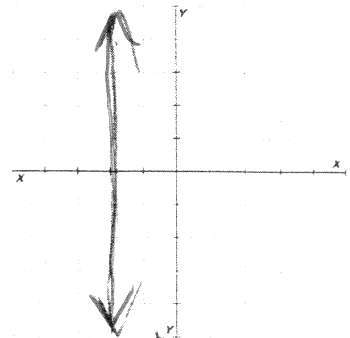
15) Graph the linear equation.

$y=4$



16) Graph the linear equation.

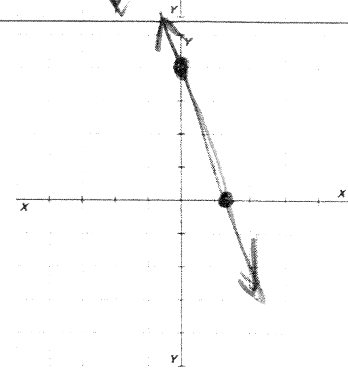
$x = -2$



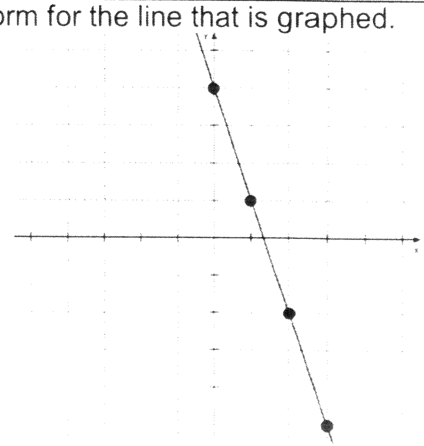
17) Graph the linear equation (standard form).

$6x + 2y = 8$

$(\frac{4}{3}, 0)$ $(0, 4)$



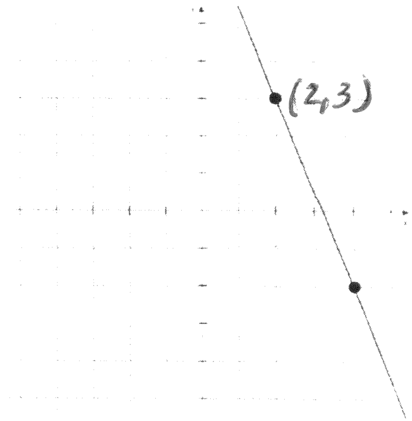
18) Write the equation in slope-intercept form and standard form for the line that is graphed.



Slope-intercept form $y = -3x + 4$

Standard form $3x + y = 4$

19) Write the equation in slope-intercept form and standard form for the line that is graphed.



Slope-intercept form $y = -\frac{5}{2}x + 8$

Standard form $5x + 2y = 16$

$y - 3 = -\frac{5}{2}(x - 2)$ $\quad 2\left(\frac{5}{2}x + y = 8\right)$

$y - 3 = -\frac{5}{2}x + 5$
$\;\;+3 \qquad\quad +3$

20) Determine the equation of the line that goes through the points.
$(-5,6)$ & $(2,-15)$ $\quad \frac{-15-6}{2-(-5)} = \frac{-21}{7} = -3$

$y - 6 = -3(x + 5)$
$y - 6 = -3x - 15$
$\boxed{y = -3x - 9}$

21) Determine the equation of the line that goes through the points.
$(-5,6)$ & $(2,6)$

$y = 6$

22) Determine the equation of the line that goes through the points.
$(-11,-7)$ & $(-11,3)$

$x = -11$

23) Find the equation for a line with the given properties.
$Slope = 0$ & containing the point $(-5,6)$

$y = 6$

24) Find the slope-intercept equation for a line with the given properties.
$x - \text{int} = 3$ & $y - \text{int} = -8$

$(3,0)$
$(0,-8)$ $\quad m = \frac{8}{3}$

$\boxed{y = \frac{8}{3}x - 8}$

25) Find the slope-intercept equation for a line with the given properties.
Parallel to $y = -2x + 7$ & containing the point $(-7,6)$

$y - 6 = -2(x + 7)$
$y - 6 = -2x - 14$
$\qquad\qquad\quad +6$

$\boxed{y = -2x - 8}$

26) Find the slope of the line perpendicular to the line containing the points.

$(2,-5)$ & $(-6,-9)$

$\dfrac{-9-(-5)}{-6-2} = \dfrac{-4}{-8} = \dfrac{1}{2}$

$\boxed{m = -2}$ perp slope

27) Find the slope-intercept equation for a line with the given properties.

Perpendicular to $y = 4x$ & containing the point $(-8, 9)$

$y - 9 = -\frac{1}{4}(x+8)$

$-\frac{1}{4}x - 2$
$+9$

$y = -\frac{1}{4}x + 7$

28) Simplify using properties of exponents.

$(4xy^7)(-3x^5y^2)$

$-12x^6y^9$

29) Simplify using properties of exponents.

$\dfrac{18x^3y^7}{12xy^{10}}$

$\dfrac{3x^2}{2y^3}$

30) Simplify using properties of exponents.

$(-3x^5y^3)^4$

$81x^{20}y^{12}$

31) Simplify using properties of exponents.

$(4xy^7)^2(-3x^5y^2)$

$16x^2y^{14}$

$-48x^7y^{16}$

32) Simplify using properties of exponents.

$\dfrac{-8x^{-3}y^{-7}z^5}{12x^{-1}y^{10}z^{-6}}$

$\dfrac{-2z^{11}}{3x^2y^{17}}$

33) Subtract the polynomials.

$(4x^5 - 6x^3 + x^2 - 9x + 16) - (3x^4 - 5x^3 - 7x^2 + x + 12)$

$4x^5 - 3x^4 - x^3 + 8x^2 - 10x + 4$

34) Multiply the polynomials.

$$5(3x^4 - 5x^3 - 7x^2 + x + 12)$$

$15x^4 - 25x^3 - 35x^2 + 5x + 60$

35) Multiply the polynomials.

$$(x-4)(2x+3)$$

$2x^2 - 5x - 12$

36) Factor the polynomial

$$30x - 18y + 12$$

$6(5x - 3y + 2)$

37) Factor the polynomial

$$17x^6 + 16x^5 - 4x^4$$

$x^4(17x^2 + 16x - 4)$

38) Factor the polynomial.

$$x^2 + 10x + 16$$

$(x+8)(x+2)$

39) Factor the polynomial.

$$2x^2 - 5x - 12$$

$(2x+3)(x-4)$

-24 -8 3 -5

40) Factor the polynomial.

$$3x^2 - 37x + 12$$

$(3x-1)(x-12)$

36 -36 -1 -37

41) Factor the polynomial.

$$4x^2 + 20x + 25$$

$(2x+5)^2$

42) Factor the polynomial.

$$x^2 - 49$$

$(x-7)(x+7)$

43) Factor the polynomial.

$$9x^2 - 100$$

$(3x-10)(3x+10)$

44) Factor the polynomial.

$$2x^2 - 14x + 24$$

$2(x^2 - 7x + 12)$

$2(x-3)(x-4)$

45) Factor the polynomial.

$$3x^3 - 12x$$

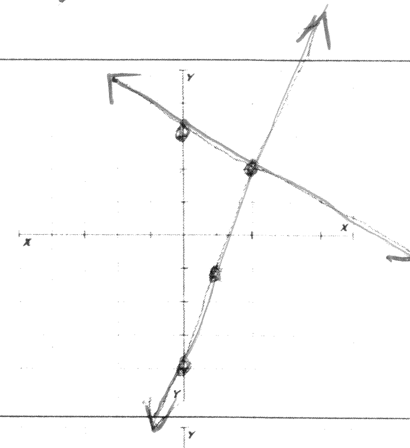
$3x(x^2-4)$

$3x(x-2)(x+2)$

46) Solve the system of equations by graphing.

$$\begin{cases} y = 3x - 4 \\ y = -\frac{1}{2}x + 3 \end{cases}$$

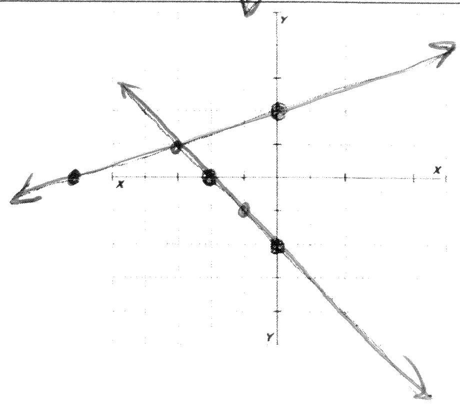
$(2,2)$



47) Solve the system of equations by graphing.

$$\begin{cases} x + y = -2 \\ x - 3y = -6 \end{cases}$$

$(-3,1)$



48) Solve the system of equations by using substitution or elimination.

$$- \begin{cases} x + y = 5 \\ x + 2y = 3 \end{cases}$$

$-y=2$

$y=-2$

$(7,-2)$

49) Solve the system of equations by using substitution or elimination.

$$\begin{cases} x = 12 - 7y \\ 3x - 5y = 10 \end{cases}$$

$3(12-7y)-5y=10$

$36-21y-5y=10$

$-26y=-26$

$y=1$

$(5,1)$

50) Solve the system of equations by using substitution or elimination.

$$+ \begin{cases} x + y = 5 \\ x - y = 11 \end{cases}$$

$2x=16$ $x=8$

$(8,-3)$

51) Solve the system of equations by using substitution or elimination.

$$- \begin{cases} 2x + 6y = -10 \\ (3x + y = 9)6 \end{cases}$$

$18x+6y=54$

$-16x=-64$

$x=4$

$(4,-3)$

52) Simplify the radical.

$\sqrt{128}$ $\quad 8\sqrt{2}$

$64 \cdot 2$

53) Multiply the radicals and simplify.

$\sqrt{2} \bullet \sqrt{6}$ $\quad 2\sqrt{3}$

$2 \cdot 3$

54) Multiply the radicals and simplify.

$\sqrt{5} \bullet \sqrt{5}$ $\quad 5$

55) Multiply the radicals and simplify.

$3\sqrt{8} \bullet 2\sqrt{6}$ $\quad 24\sqrt{3}$

$6\sqrt{48}$

$16 \cdot 3$

56) Multiply the radicals and simplify.

$6\sqrt{2} \bullet 5\sqrt{18}$ $\quad 180$

$30\sqrt{36}$

57) Add the radicals.

$3\sqrt{2} + 5\sqrt{2} - \sqrt{2}$ $\quad 7\sqrt{2}$

58) Add the radicals.

$4\sqrt{7} - 5\sqrt{3} - 6\sqrt{3} + 8\sqrt{7}$ $\quad 12\sqrt{7} - 11\sqrt{3}$

59) Add the radicals.

$\sqrt{12} + \sqrt{75}$ $\quad 7\sqrt{3}$

$2\sqrt{3} + 5\sqrt{3}$

60) Add the radicals.

$3\sqrt{8} + 5\sqrt{18}$

$3 \cdot 2\sqrt{2} \quad 9 \cdot 2$

$6\sqrt{2} \cdot 5 \cdot 3\sqrt{2}$ $\quad 21\sqrt{2}$

$15\sqrt{2}$

61) Evaluate the function notation.

$g(x) = -\frac{3}{5}x + 4$

Find $g(10) =$ $-\frac{3}{5}(10) + 4 \quad = \boxed{-2}$

62) Evaluate the function notation.

$h(x) = 4x^2 - 3x + 11$

Find $h(-3) =$ $4(-3)^2 - 3(-3) + 11$

$36 + 9 + 11$

$\boxed{56}$

63) Find the value of x in the function notation equation.

$g(x) = -\frac{3}{5}x + 4$

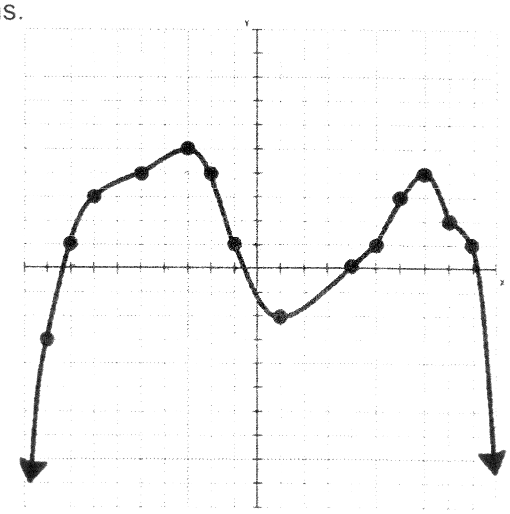
$10 = -\frac{3}{5}x + 4$

$-\frac{5}{3} \cdot 6 = -\frac{3}{5}x \cdot -\frac{5}{3}$

Find m *so that* $g(m) = 10$

$x = -10$

Use the graph of $p(x)$ to answer the following questions.



64) *Find* $p(-9) = -3$

65) *Find* $p(4) = 0$

66) *Find* $p(8) = 2$

67) *Find* x *so that* $p(x) = 5$ $\quad x = -3$

68) *Find* x *so that* $p(x) = 4$

$x = -5, -2, 7$

69) *Find* x *so that* $p(x) = 1$

$x = -8, -1, 5, 9$

70) Solve the problem using a system of equations.

A farmer has only chicken and pigs on his farm with a total of 48 heads and 130 legs. How many chicken and pigs does he have?

$2(c+p=48)$ 	$2c+2p=96$

$2c+4p=130$ 	$-\ 2c+4p=130$

$-2p=-34$

$p=17$

$2c=62,\ c=31$

17pigs 31chickens ✓

71) Solve the problem using a system of equations.

At the "Strikes to Spare" bowling lanes, the management is trying to decide on a plan to attract large groups on Sundays. Plan A is a \$25 charge for the group, then \$1.50 per game per each member. Plan B is to lower the charge to \$20 but raise the price per game to \$1.60. How many games would need to be bowled to result in the same price? What is that price?

$\boxed{A}$ $T = 1.50g + 25$

$\boxed{B}$ $T = 1.60g + 20$

$1.50g + 25 = 1.60g + 20$

$5 = .10g$

$g = 50$ games

$T = 1.50(50) + 25$

\$100

$\boxed{\text{50games, \$100 price}}$

END