Algebra 2 Honors
WS: Summer Work Extra Practice

Name ___Key___
Date ___9/6, 9/7___ Block ___ALL___

In 1 – 2, solve each system of equations by graphing.

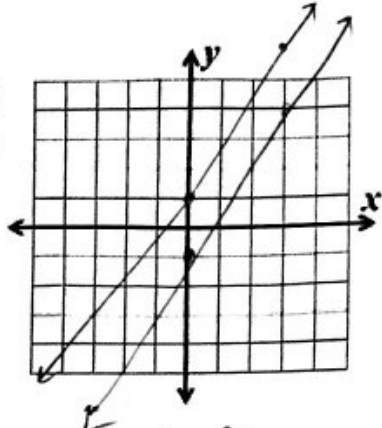1. $\begin{cases} y = \dfrac{3}{4}x - 2 \\ x = -4 \end{cases}$
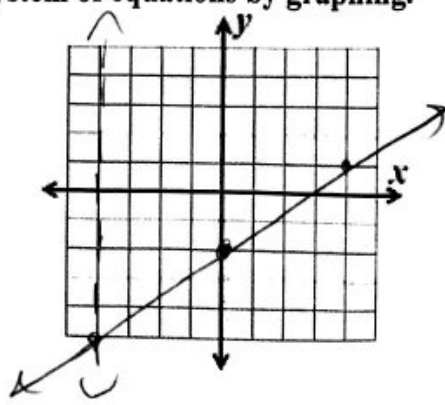
$(-4, -5)$

2. $\begin{cases} 5x - 3y = -3 \\ 10x - 6y = 6 \end{cases}$

$y = \dfrac{5}{3}x + 1$

$y = \dfrac{5}{3}x - 1$

No Solution

3. Create a system of equations for the following problem, but don't solve. Identify each variable's meaning.

Mr. Brust likes to reward his students so he purchased 2 kinds of candy for a math game. He can't remember how many of each he purchased, but he does remember that the Chocolate Smoothies cost $0.50 each and the Super Pops cost $0.60 each. He purchased a total of 30 pieces of candy for $16.80.

$\underset{\text{(variable)}}{C} = \underset{\text{(what the variable represents)}}{\text{\# of chocolate Smoothies}}$

$\underset{\text{(variable)}}{S} = \underset{\text{(what the variable represents)}}{\text{\# of super pops}}$

Equation 1: $\quad C + S = 30$

Equation 2: $\quad 0.50C + 0.60S = 16.80$

In 4 - 6, solve each system using substitution or elimination.

4. $\begin{cases} \dfrac{1}{2}y = x \\ 3x - 6y = 9 \end{cases}$

$x = \dfrac{1}{2}(-2)$
$x = -1$

$3\left(\dfrac{1}{2}y\right) - 6y = 9$

$\dfrac{3}{2}y - 6y = 9$

$-\dfrac{9}{2}y = 9$

$-9y = 18$

$y = -2$

$\boxed{(-1, -2)}$

5. $\begin{cases} 4 - 2y = x \\ x + 9y = 11 \end{cases}$

$x = 4 - 2(1)$
$x = 2$

$4 - 2y + 9y = 11$

$4 + 7y = 11$

$7y = 7$

$y = 1$

$\boxed{(2, 1)}$

6. $\begin{cases} -10x - 2y = -1 \\ y = -5x + 2 \end{cases}$

$-10x - 2(-5x + 2) = -1$

$-10x + 10x - 4 = -1$

$-4 = -1$

$\boxed{\text{No Solution}}$

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7. Is $(4x + 3)(2x - 7)$ the factored form of $8x^2 - 22x - 21$? Justify your answer by showing work.

$8x^2 - 28x + 6x - 21$

$8x^2 - 22x - 21$ $\boxed{\text{yes}}$

In 8 – 13, factor the following. Check your answer by multiplying!

8. $5p^2 + 9p - 2$

$\boxed{(5p - 1)(p + 2)}$

9. $4n^2 - 17n + 4$

$\boxed{(4n - 1)(n - 4)}$

10. $25x^2 - 36$

$\boxed{(5x + 6)(5x - 6)}$

11. $p^3 - 4p^2 - 3p$

$\boxed{p(p^2 - 4p - 3)}$

12. $8n^2 - 34n + 8$

$2(4n^2 - 17n + 4)$

$\boxed{2(4n - 1)(n - 4)}$

13. $12x^3 - 27x$

$3x(4x^2 - 9)$

$\boxed{3x(2x + 3)(2x - 3)}$

In 14 – 17, solve by facoring.

14. $6x^2 - x = 2$

$6x^2 - x - 2 = 0$ $\boxed{\{-\frac{1}{2}, \frac{2}{3}\}}$

$(3x - 2)(2x + 1) = 0$

$x = \frac{2}{3}, -\frac{1}{2}$

15. $3m^2 + 5m = 2$ $\boxed{\{-2, \frac{1}{3}\}}$

$3m^2 + 5m - 2 = 0$

$(3m - 1)(m + 2) = 0$

$m = \frac{1}{3}, -2$

16. $18x^2 = 2x^3 + 40x$ $\boxed{\{0, 4, 5\}}$

$2x^3 - 18x^2 + 40x = 0$

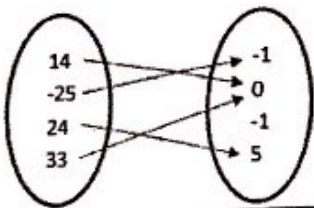$2x(x^2 - 9x + 20) = 0$

$2x(x - 5)(x - 4) = 0$

17. $5y^2 - 25y = 0$ $\boxed{\{0, 5\}}$

$5y(y - 5) = 0$

$y = 0, 5$

Determine if the following are functions. For each function, state the domain and range. If it is not a function, explain why.
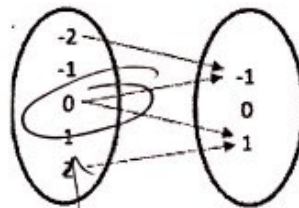
18.

$\boxed{\begin{array}{l}\text{Function} \\ D: \{-25, 14, 24, 33\} \\ R: \{-1, 0, 5\}\end{array}}$

19.

$\boxed{\text{Not a Function}}$

Let the functions $A(x) = 5x^2 - 2$, $B(x) = |x| + 2$, and $C(x) = \sqrt{x}$. Find the following.

20. $B(-2) = 4$

$B(-2) = |-2| + 2$
$\quad 2 + 2$

21. $C(4) + A(3) = 45$

$C(4) = \sqrt{4} = 2$
$A(3) = 5(3^2) - 2 = 43$

22. $C(1) + C(100) = 11$

$C(1) = \sqrt{1} = 1$
$C(100) = \sqrt{100} = 10$

23. Find x, if $A(x) = 43$

$43 = 5x^2 - 2$
$45 = 5x^2$ $\boxed{x = \pm 3}$
$x^2 = 9$

24. Give the domain of $C(x)$

$[0, \infty)$
$\boxed{x \geq 0}$

25. Find x if $B(x) = 21$

$|x| + 2 = 21$
$|x| = 19$ $\boxed{x = \pm 19}$

Find the values using the graph.

26. What is the range of $F(x)$? $-7 \leq y \leq 3$

27. $F(8) = -7$

28. If $F(x) = -4$, find x. $x = 7$

29. Where is $F(x)$ decreasing?

$-6 < x < -4, \ 0 < x < 3, \ 5 < x < 8$

30. What is the maximum of $F(x)$?

3

31. x – intercepts: $-5, -3, 2, 4, 6$

32. y – intercept: 3

33. What is the domain of $F(x)$? $-6 \leq x \leq 8$

34. If $F(x) = 6$, find x. DNE

35. Where does $F(x)$ have a constant rate of change?

$-6 < x < -4, \ -3 \leq x < 5, \ 5 < x < 8$