

**Algebra II 1<sup>st</sup> Semester Final Exam Mr. Cox** Name \_\_\_\_\_

I. Multiple Choice

- \_\_\_\_\_ 1. Which is a factor of  $b^3 - 10b^2 + 24b$  ?  
(A)  $b - 2$  (B)  $b - 4$  (C)  $b + 6$  (D)  $b + 12$
- \_\_\_\_\_ 2. The graph of the equation  $y = -2x + 5$  does *not* pass through the point whose coordinates are  
(A) (1, 3) (B) (-1, 7) (C) (3, 1) (D) ( $\frac{1}{2}$ , 4)
- \_\_\_\_\_ 3. The function  $f(x) = x - x^2$  has its maximum value when  
(A)  $x = 1$  (B)  $x = -1$  (C)  $x = \frac{1}{2}$  (D)  $x = 0$
- \_\_\_\_\_ 4. If  $x = 8$ , what is the value of  $3x^0 - 2x^{-\frac{1}{3}}$   
(A)  $\frac{3}{4}$  (B) 2 (C)  $2\frac{3}{4}$  (D) 0
- \_\_\_\_\_ 5. A solution of the equation  $x^2 - 4 = 0$  is  
(A) 0 (B) -2 (C) -4 (D) 4
- \_\_\_\_\_ 6. What is the solution of the equation  $2x^2 - 10 = 0$  ?  
(A)  $\sqrt{5}$  and  $-\sqrt{5}$  (C)  $\sqrt{10}$  and  $-\sqrt{10}$   
(B) 5 and -5 (D) 10 and -10
- \_\_\_\_\_ 7. The slope of a line which is perpendicular to the line that passes through the points (3, 1) and (3, 5) is  
(A) undefined (B) 0 (C) 3 (D) -3

II. Short Answer

- \_\_\_\_\_ 8. Find the value of  $x$  for which the expression  $\frac{2}{x-4}$  is undefined.
- \_\_\_\_\_ 9. What is the slope of a line whose equation is  $y = 7$  ?
- \_\_\_\_\_ 10. Which fraction is equivalent to  $0.1212\overline{12}$  ?
- \_\_\_\_\_ 11. Which property is illustrated?  $3(4 + 5) = 3(4) + 3(5)$
- \_\_\_\_\_ 12. Use  $<$ ,  $=$ , or  $>$  to compare the numbers:  $-2.5$  \_\_\_\_  $-2.1$

\_\_\_\_\_ 13. Evaluate the expression  $2 \cdot 5^2 + 6 \cdot 4$

\_\_\_\_\_ 14. Evaluate the expression  $\frac{4 + 5 \cdot 3}{6 - 4}$

\_\_\_\_\_ 15. Solve for y:  $7y + 2(y - 8) = 11$

\_\_\_\_\_ 16. Solve for x:  $8x + 1 = 6x - 13$

III. Free Response. SHOW ALL WORK!

\_\_\_\_\_ 17. Solve the equation  $2x^2 - 5x - 4 = 0$  and leave the answer in simplest *decimal* form.

\_\_\_\_\_ 18. Solve the following system of equations for x, y, and z.

$$\begin{aligned}4x + 2y + z &= 7 \\x - y + 6z &= -1 \\2x + 3y - 5z &= 5\end{aligned}$$

\_\_\_\_\_ 19. If 250 kilograms of corn are needed to feed 5,000 chickens, how many chickens can be fed with 140 kilograms of corn?

\_\_\_\_\_ 20. Factor completely:  $y^2x - x^3$

\_\_\_\_\_ 21. Solve the following system of equations:  $4x - 3y = 8$   
 $2x + y = -1$

\_\_\_\_\_ 22. Factor completely:  $6x^2 - 7x - 3$

\_\_\_\_\_ 23. Find the value of  $y$  so that the graph of the equation  $5x + 2y = 12$  passes through the point whose coordinates are  $(4, y)$ .

\_\_\_\_\_ 24. Write the equation of the line which is parallel to  $y = -4x + 3$  and passes through the origin.

#### IV. Multiple Choice

\_\_\_\_\_ 25. If  $f(x) = |x - 1|$ , then  $f(-3) =$   
(A) -4      (B) 2      (C) 3      (D) 4

\_\_\_\_\_ 26. What is the equation of the straight line that passes through the points  $(-2, 5)$  and  $(-6, -3)$ ?  
(A)  $2x + 7 = 0$       (C)  $x - 2y = -12$   
(B)  $2x - y = -9$       (D)  $5x + 2y = 0$

\_\_\_\_\_ 27. Which is true for the domain of the function  $y = \frac{x^2 - 9}{x - 2}$ ?  
(A)  $x \neq -2$       (B)  $x \neq 2$       (C)  $x \neq 0$       (D)  $x \neq 4$

- \_\_\_\_\_ 28. What are the coordinates of the vertex of the parabola whose equation is  $y = x^2 + 2x - 11$  ?  
 (A) (-1, -12)    (B) (1, -8)    (C) (-2, -11)    (D) (2, -3)
- \_\_\_\_\_ 29. In the system of equations,  

$$kx + y = 7 \text{ and}$$

$$2x - y = 3,$$
 there is *no* solution when *k* is equal to  
 (A) 5    (B) 2    (C) -2    (D) -5
- \_\_\_\_\_ 30. The solution of the equation  $|y - 5| = 2$  is  
 (A)  $y = 7$     (B)  $y = 3$     (C)  $y = 7$  and  $y = -7$     (D)  $y = 7$  and  $y = 3$
- \_\_\_\_\_ 31. A root of the equation  $(x - 1)^2 - (x - 1) = 0$  is  
 (A) -1    (B) 2    (C) 0    (D) -4
- \_\_\_\_\_ 32. Which value of  $x$  satisfies the inequality  $|x| + 2 < 5$  ?  
 (A) -5    (B) -2    (C) -3    (D) 4
- \_\_\_\_\_ 33. What is the solution of the inequality  $3x + 1 \geq 11 - 2x$  ?  
 (A)  $x \leq -2$     (B)  $x \geq 2$     (C)  $x \geq -2$     (D)  $x > 0$
- \_\_\_\_\_ 34. Which represents the solution of the inequality  $|2x - 1| < 7$  ?  
 (A)  $x < -3$  or  $x > 4$     (C)  $-3 < x < 4$   
 (B)  $x < -4$  or  $x > 3$     (D)  $-4 < x < 3$
- \_\_\_\_\_ 35. Which of the following is *not* a function?  
 (A)  $\{(1, 2), (-2, 2), (3, 3)\}$   
 (B)  $\{(1, 2), (-2, 6), (3, 3)\}$   
 (C)  $\{(2, 2), (2, 3), (4, 3)\}$   
 (D)  $\{(1, 3), (2, 3), (4, 3)\}$

- \_\_\_\_\_ 36. The product of a  $2 \times 3$  matrix and a  $3 \times 2$  matrix is  
 (A) a  $3 \times 3$  matrix      (B) a  $2 \times 2$  matrix      (C) a  $2 \times 3$  matrix  
 (D) Can not be done

- \_\_\_\_\_ 37. Which of the following could be used to find  $x$  in this system?  $\begin{cases} 3x + 8y = 13 \\ 5x - 3y = 11 \end{cases}$

A.  $\begin{vmatrix} 3 & 8 \\ 5 & -3 \\ 13 & 8 \\ 11 & -3 \end{vmatrix}$       B.  $\begin{vmatrix} 13 & 8 \\ 11 & -3 \\ 3 & 8 \\ 5 & -3 \end{vmatrix}$       C.  $\begin{vmatrix} 3 & 13 \\ 5 & 11 \\ 3 & 8 \\ 5 & -3 \end{vmatrix}$       D.  $\begin{vmatrix} 3 & 8 \\ 5 & -3 \\ 3 & 13 \\ 5 & 11 \end{vmatrix}$

- \_\_\_\_\_ 38. Evaluate the determinant:  $\begin{vmatrix} 3 & -7 \\ -4 & 9 \end{vmatrix} =$   
 (A) 23      (B) 1      (C) -1      (D) 55

- \_\_\_\_\_ 39. Write in simplest radical form:  $\sqrt{40} =$   
 A)  $10\sqrt{2}$       B)  $4\sqrt{5}$       C)  $2\sqrt{10}$       D)  $4\sqrt{10}$

- \_\_\_\_\_ 40. Graph  $6x - 5y < -30$

