Algebra 2 REVIEW for the Semester Exam, Fall 2014

1. How many solutions does the following system have? $3x + y = 4$ $2x + 2y = 8$	2. Evaluate $2x^2 - 4x$ for x = -3.
3. What is the product? $5\begin{bmatrix} -2 & 1 \\ 4 & 10 \end{bmatrix}$	**4**. Solve $\lvert x + 11 \rvert = 4$.
5. The slope of a line in the form $y = mx + b$ is	**6.** What tells you if a function is linear?
7. The population of a city rises from 110,000 to 221,000 over a ten-year period. Using the points (0, 110000) and (10, 221000), find the average rate of change in people per year.	**8.** Solve for t in the formula $B = 9s^2t$
9. An equation of the line perpendicular to the line $y = -\frac{3}{5}x + 4$ with a y-intercept of -5 is?	**10.** Your softball team is ordering equipment from a catalog. Each bat costs $42. The cost of shipping is $15 no matter how much you order. The total cost is $388. How many bats did your team order?
11. Simplify: $-2(x - 2) - 9(x - 1)$	**12.** Solve: $6b - 8 \leq 5b + 5$

13. Solve the equation: $-10 + 2x = 14$	**14.** Decide whether Line 1 and Line 2 are parallel, perpendicular, or neither. **Line 1** passes through (-8,-1) and (-13,3) **Line 2** passes through (-6,9) and (-10, 4)
15. Solve: $x - 6 \leq 5$ *or* $x + 6 \geq 14$	**16.** Write the slope-intercept form of the line that passes through the point (-5, 4) and (-6,-1).
17. Find the domain of the relation: $\{(4,-2),(-2,3),(1,-3)\}$	**18.** Write the slope-intercept form of the line that passes through the point (-3,7) and is parallel to the line $y = 2x + 4$.
19. Find the slope of the line passing through the points (-2, 4) and (7,-1).	**20.** Mr. Frankel bought 4 tickets to a puppet show and spent $22. He bought a combination of child tickets for $2 each and adult tickets for $6 each. What system of equations will determine the number of adult tickets, *a*, and the number of child tickets, *c*, he bought?
21. A rectangle has a length of $x + 7$ and a width of $x - 2$. What equation describes the perimeter, *P*, of the rectangle in terms of *x*?	**22.** For the function$y = x^2 - 6x + 8$, find the vertex and axis of symmetry.
23. Write a system of equations to solve for the number of tickets sold. Tickets to a local movie were sold at $3.00 for adults and $2.50 for students. If 360 tickets were sold for a total of $650.00, approximately how many adult tickets were sold?	**24.** What are the x-intercepts of $y = -2(x - 8)(x + 3)$

25. Find the sum. $\begin{bmatrix} 2 & -2 \\ 13 & -7 \end{bmatrix} + \begin{bmatrix} -40 & -3 \\ 24 & 5 \end{bmatrix}$

26. Factor the expression $m^2 - 3m - 28$

27. Solve the system of equations:

$$x + y + z = 16$$
$$-2x - y + z = 4$$
$$x - 2y - 2z = -12$$

28. Evaluate the determinant: $\begin{vmatrix} 5 & 1 \\ 2 & 4 \end{vmatrix}$

29. Use the quadratic formula to find the roots of $x^2 + 12x - 32 = 0$.

30. Factor the expression $4x^2 + 11x + 6$.

31. Find the solutions:

$$4x^2 - 16x - 20 = 0$$

32. What are the solutions of

$-3-y^2 = 14$?

33. Factor: $9x^2 - 16$

Word Problems…

34. A vendor sold 200 tickets for an upcoming rock concert. Floor seats were $30 and stadium seats were $24. The vendor sold $6080 in tickets.

How many $30 and $24 tickets did the vendor sell?

35. For a period of 48 months, the average monthly operating cost for a small business C (in dollars) can be approximated by the model $C = 0.55t^2 + 550$ where t is the number of months. During which month was the average operating cost $1230?

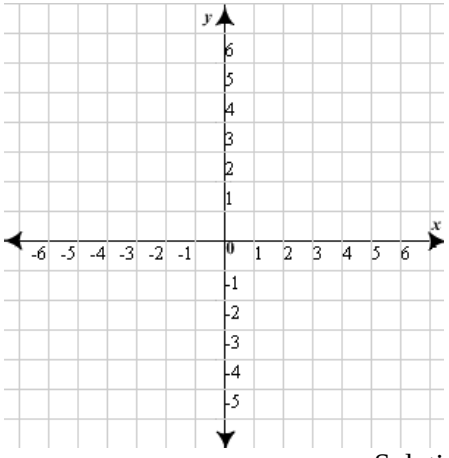
36. Eight classmates are going to share a birthday cake after school. The rectangular birthday cake is 6 pieces long and 4 pieces wide. Each person eats the same number of pieces. How many pieces does each person eat?

37. A car can travel 31 miles per gallon of gas. The gas tank contains 12 gallons. How far can the car travel without refueling?

38. On Friday, you drove 115 miles to stay at your grandmother's house. On Sunday, you returned home and calculated that the round trip travel time was 4 hours. What was your average speed?

39. Graph the linear system and estimate the solution.

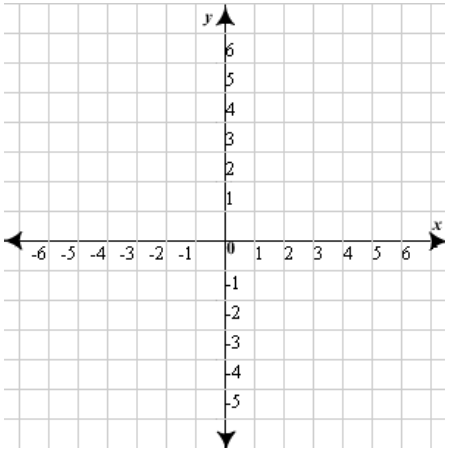
$$x + y = 5$$
$$3x - y = -2$$



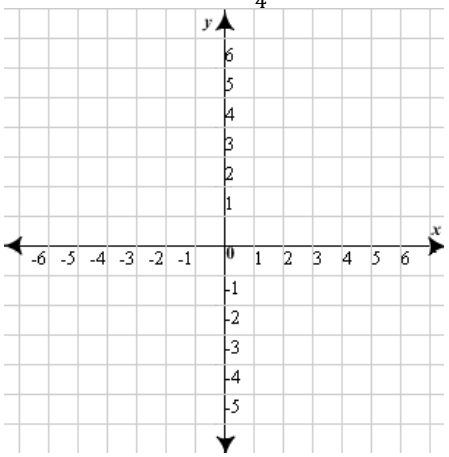
Solution: _____

40. Graph the system of inequalities.

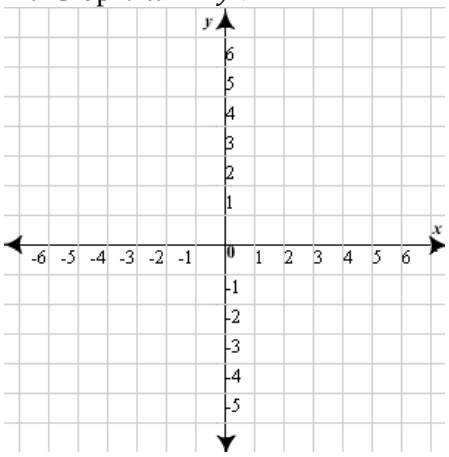
$$y \geq 3$$
$$x \leq 4$$



41. Graph $f(x) = -\frac{3}{4}x + 5$.



42. Graph: $x - 7y > -14$



Write in standard form:

43. $y = (x + 4)^2 - 3$	44. $y = -2(x + 1)^2$	45. $y = -(x + 3)^2 - 5$

Find the roots: **(hint: Factor and solve)**

46. $y = x^2 - 2x - 8$	47. $y = 4x^2 - 10x - 6$
48. $y = x^2 - 3x - 10$	49. $y = 3x^2 - x - 14$