# Math 50 - *Elementary Algebra*
# Final Exam, Spring 2011

Name: _____ Date: _____ Score: _____/100

**Show the necessary work on the test copy. For any of the graphs use a straight-edge to receive full credit. Place your answers in the blanks provided to the right of the problem. The points for each problem are to the right of the blank.**

1. Write the following phrase as an algebraic expression and simplify if possible. Let $x$ represent the unknown number.

   "*Four times a number subtracted from 5, added to 11.*" _____ (1)

   (simplified) _____ (1)

2. Solve each equation.

   (a) $5x + 2(x - 1) = -2(3 - 4x)$ _____ (2)

   (b) $0.4x + 2.4 = 0.2x - 0.4 + 3.2$ _____ (2)

   (c) $\frac{x}{2} + 3 = \frac{x}{4}$ _____ (2)

3. Solve $A = P + PRT$ for $T$. T = _____ (2)

4. In a river that has a current flowing at 7 miles per hour, a speed boat can travel upstream a distance of 74 miles in 2 hours. What would be the speed of the boat in still water?

_____ (3)

5. Solve.

$|x + 5| - 10 = 3$ _____ (3)

6. After depreciating (decreasing) in value by 6% last year, a truck is now worth $\$51,042$. What was it worth last year? What is the amount of the depreciation?

Last year's value: _____ (2)

Dollar amount of depreciation: _____ (1)

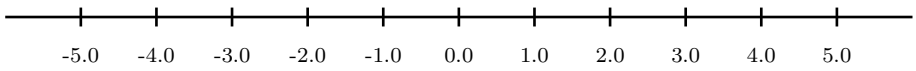
7. A cattle farmer is planning to convert an empty 14 acre field into grazing area for his cattle. He needs 2 acres for stables and a barn, and each cow requires 0.45 acres. How many cows can he raise on his farm? Express the situation as an inequality and then solve it.

Inequality: _____ (1)

Solution: _____ (2)

8. (a) Solve the compound inequality, write the solution in interval notation and (b) graph the solution set.

$-7 < 2 + 3x \leq 5$ (a) Interval: _____ (3)



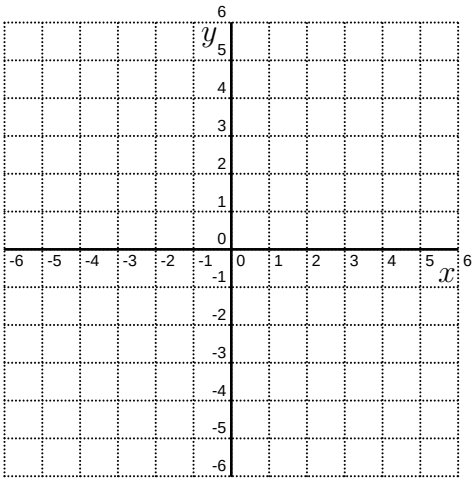

(b) Graph: (1)

9. Graph the linear equation by finding and plotting its intercepts.

$3x - 5y = -15$ x-Intercept: _____ (1)

y-Intercept: _____ (1)

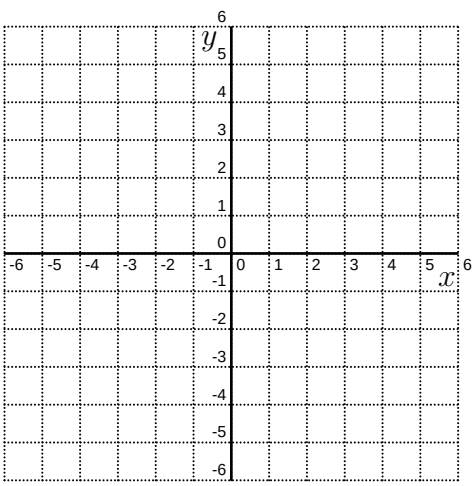
Graph: (2)




10. Graph the linear equation and find the slope of the line. Write '$N$' if the slope is not defined.

$y = 3$ Slope: _____ (1)

Graph: (2)



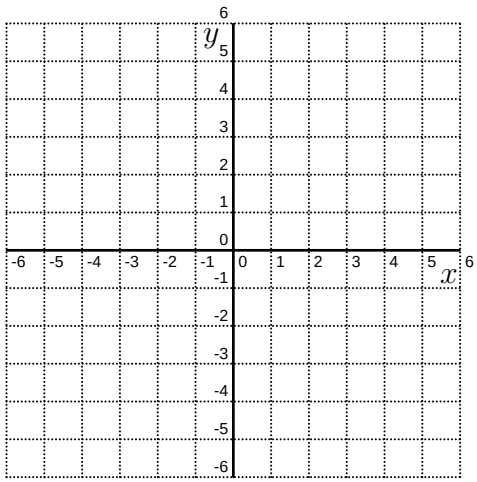
11. Find the slope and the y-intercept of the line. Use them to graph the equation.

$x + 3y = 9$

Slope: _____ (1)

y-Intercept: _____ (1)

Graph: (2)




12. (a) Find the slope-intercept form of the line given by $2x - 5y = 7$.

    (b) Is the line given by this equation parallel, perpendicular, or neither to the line given by the equation $5x + 2y = 8$?

(a) _____ (2)

(b) _____ (1)

13. Given $f = \{(-1, 4), (1, 2), (3, 2), (5, 3)\}$.

State the domain. Domain: _____ (1)

State the range. Range: _____ (1)

Is the relation a function? (Y/N): _____ (1)

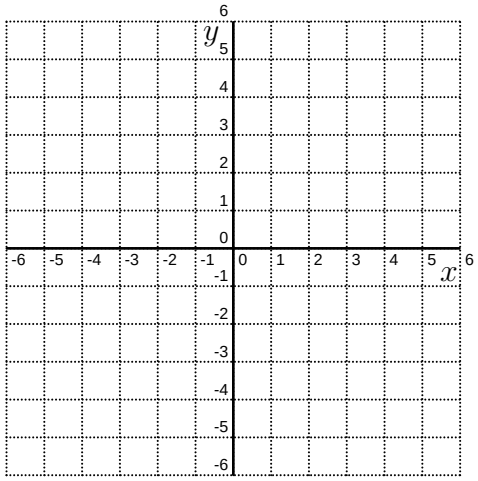
14. Find the equation of the line that passes through $(1, -6)$ and $(3, 2)$. Your answer should use function notation, that is, $f(x) = ax + b$.

_____ (3)

15. Given the function $f(x) = 5\left(1 + \frac{x}{2}\right)^2$. Find $f(6)$. _____ (1)

16. Graph the nonlinear function $f(x) = |x-3|$. State the domain and the range of the function.

Graph: (3)




Domain: _____ (1)

Range: _____ (1)

17. Solve the system of equations by using a method of your choice. Write an ordered pair if there is one solution; otherwise, write '$N$' if there is no solution or '$I$' if there are infinitely many solutions.

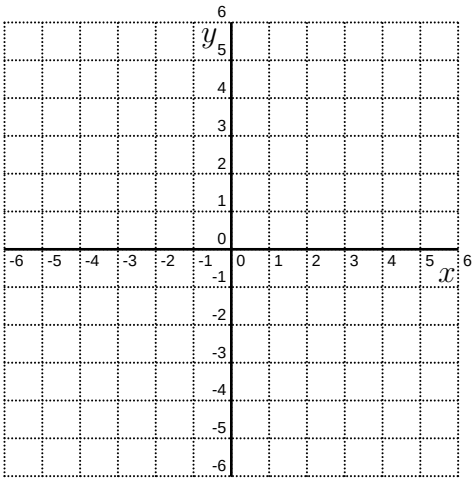
$$\begin{cases} 4x + 5y = 7 \\ 3x - y = 10 \end{cases}$$

_____ (3)

18. Graph the solution of the system of linear inequalities.

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

Graph: (5)




19. Grape milk is a delicious drink made by mixing grape juice with milk. You like to drink 40% grape milk. The store, however, sells only 30% and 80% grape milk. How much of each grape milk that is sold by the store must you mix to obtain 20 fluid ounces of 40% grape milk? Use a system of equations where $x$ represents the amount of 30% grape milk and $y$ represents the amount of the 80% grape milk needed.

System of equations: (I) _____ (1)

(II) _____ (1)

Solution: _____ (3)

20. Convert from scientific to standard notation: $5.75 \times 10^4$. _____ (1)

21. Evaluate the expression using exponential rules, without converting factors into standard notation. Present the product in scientific notation. *Show your work.*

$(2 \times 10^{-3}) \times (9 \times 10^5)$ _____ (2)

22. Simplify the following expressions, and write the results using positive exponents.

(a) $(.05x^2)(7x^{-3})$ _____ (1)

(b) $\dfrac{3a^4(b^2)^7}{12a^3b}$ _____ (2)

(c) $\left(\dfrac{uw^4}{5u^{-1}w^5}\right)^{-3}$ _____ (3)

23. Perform the indicated operations.

(a) $(8x^2 + 12x - 2) - (-5x^2 - 7x + 45)$ _____ (2)

(b) $3u^2v(6u^3 - 9u^6v + 13uv^8)$ _____ (2)

*23. Continued: Perform the indicated operations.*

(c) $(2x+5)(x-2y)$ _____ (2)

(d) $(4a^3-3a+12) \div (6a^2)$ _____ (2)

(e) $\dfrac{14x^2-3x+2}{2x-1}$ _____ (3)

24. Factor the following polynomials completely.

(a) $35x^6y^3+14x^5y$ _____ (2)

(b) $10a^3+4a^2-15a-6$ _____ (2)

*24. Continued: Factor the following polynomials completely.*

(c) $b^2 + 2b - 35$ _____ (2)

(d) $20p^3 - 5pq^2$ _____ (3)

25. Solve the following polynomial equations.

(a) $z(z + 1) = 4(z + 1)$ _____ (3)

(b) $10x^3 + 5x^2 = 15x$ _____ (3)