

Math 50 - *Elementary Algebra*

Final Exam, Fall 2010

Name: _____ Date: _____ Score: _____/120

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 n represent the unknown number.

“Three times the sum of a number and 5, subtracted from 11.” _____ (1)

(simplified) _____ (1)

2. Solve each equation.

(a) $1 + \frac{x}{3} = \frac{x}{2}$ _____ (2)

(b) $3x + 1 - 2(x - 3) = 2x - 1$ _____ (2)

(c) $0.5(x + 1) = 0.4(x - 2) + 1.1$ _____ (2)

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

4. A small plane can fly against the wind, blowing at a rate of 30 miles per hour, a distance of 360 miles in 3 hours. What would be the speed of the plane in still air?

_____ (3)

5. Solve.

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

6. Find last year's salary and the dollar amount of the pay raise if after a 4% increase this year's salary is \$44,200.

Last year's salary: _____ (2)

Dollar amount of pay raise: _____ (1)

7. An architect is planning the layout of a new office building, measuring 2000 sqft. Building code requires 400 sqft for hallways and fire-escapes, and offices have to measure at least 300 sqft. How many offices can the architect design into the building? Express the situation as an inequality and then solve it.

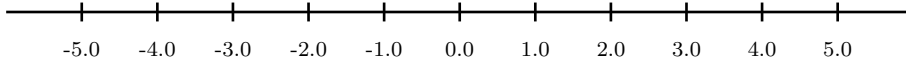
Inequality: _____ (1)

Solution: _____ (2)

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

$$-1 \leq 7 + 2x < 7$$

(a) Interval: _____ (2)

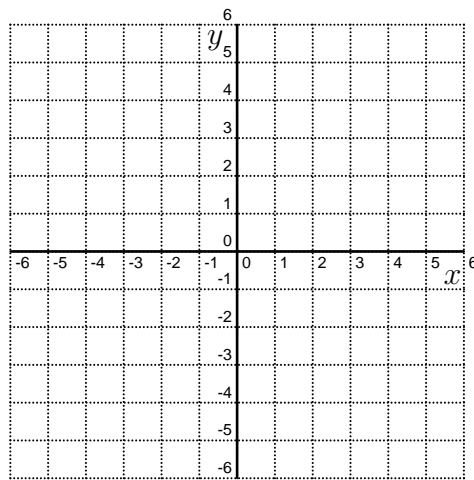


(b) Graph: (2)

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

$$-3x + 4y = 12$$

Intercepts: _____ (2)

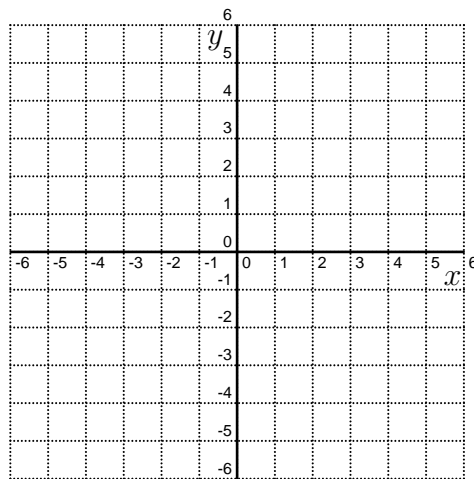


Graph: (2)

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

$$x = -2$$

Slope: _____ (1)



Graph: (2)

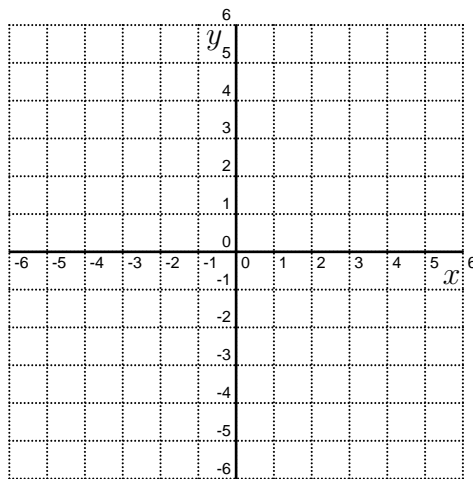
11. Find the slope and the y-intercept of the line. Use them to graph the equation.

$$2x + 5y = 10$$

Slope: _____ (1)

y-Intercept: _____ (1)

Graph: (3)



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

(b) Is the line given by this equation parallel, perpendicular, or neither to the line given by the equation $y = 2x + 3$?

(a) _____ (2)

(b) _____ (1)

13. Find an equation of the line that passes through $(-1,7)$ and $(3,-1)$. Your answer should use function notation, that is, $f(x) = ax + b$.

_____ (3)

14. Given $f = \{(-1, 4), (0, 2), (1, 4), (2, 3)\}$.

State the domain.

Domain: _____ (1)

State the range.

Range: _____ (1)

Is the relation a function?

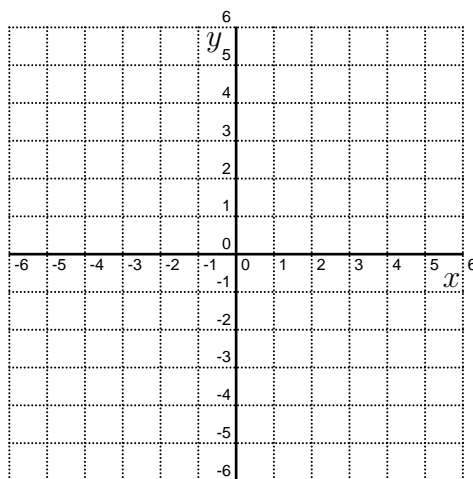
(Y/N): _____ (1)

15. Given the function $G(t) = 3t^2 - 5t - 6$. Find $G(-2)$.

_____ (1)

16. Graph the nonlinear function $f(x) = x^2 - 5$. State the domain and the range of the function.

Graph: (3)

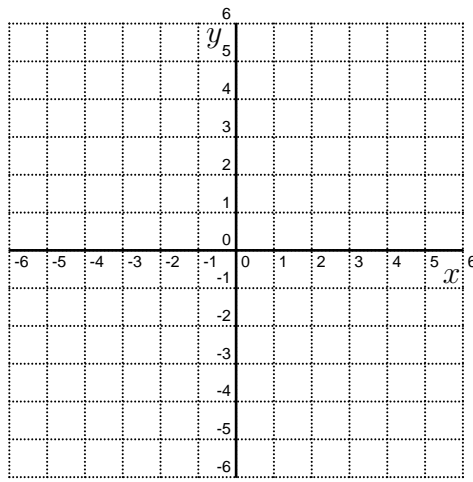


Domain: _____ (1)

Range: _____ (1)

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

$$\begin{cases} 2x - y \leq 0 \\ x + 2y > 4 \end{cases}$$



18. 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.

$$\begin{cases} 2x - 5y = -4 \\ 3x - y = 7 \end{cases}$$

_____ (4)

19. Suppose you work in a lab. You need 10 liters of an 18% acid solution for a certain test, but your supplier only ships a 10% solution and a 30% solution. You decide to make the 18% solution yourself by mixing the two available solutions. How many liters of 10% solution and 30% solution should you order? Use a system of equations where x represents the amount of the 10% acid and y represents the amount of the 30% acid needed.

System of equations: (I) _____ (1)

(II) _____ (1)

Solution: _____ (3)

20. Convert from scientific to standard notation: 4.725×10^{-3} . _____ (1)

21. Evaluate the expression without converting dividend and divisor into standard notation. Present the quotient in scientific notation.

$(2.4 \times 10^7) \div (6 \times 10^5)$ _____ (2)

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

(a) $(3x^5)(4x^{-2})$ _____ (1)

(b) $\frac{2a^2(b^4)^5}{8ab^3}$ _____ (3)

(c) $\left(\frac{w^{-2}}{5w^4}\right)^{-2}$ _____ (3)

23. Perform the indicated operations.

(a) $(4x^2 + 6x - 8) - (-4x^2 + 7x + 1)$ _____ (2)

(b) $9a^5b(2a^3 - 4a^2b + 3ab^2)$ _____ (2)

(c) $(x - 5)(3x + 2y)$ _____ (2)

(d) $(12m^2n - 3mn^2 + 16m^3) \div (6mn^2)$ _____ (2)

(e) $\frac{12x^2 - 4x + 3}{2x + 1}$ _____ (3)

24. Factor the following polynomials completely.

(a) $35x^2y^3 + 10x^5y^2$ _____ (2)

(b) $7a^3 - 14a^2 - 3a + 6$ _____ (3)

(c) $b^2 + 9b - 22$ _____ (3)

(d) $18p^2q - 8q^3$ _____ (4)

25. Solve the following polynomial equations.

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

(b) $2w^3 = 18w$ _____ (3)