

1. What is the definition of a solution to a system of equations in two variables?
2. When graphing a system of equations, what does the intersection of the two lines represent? What does it mean if there is no intersection?
3. What does the graph of an equation in two variables represent?
4. Determine if the given point is a solution to the system of equations.

a. Is $(1, 1)$ a solution to:

$$y = x$$

$$y = -x + 2$$

b. Is $(3, 2)$ a solution to:

$$y = \frac{1}{3}x + 1$$

$$y = 3x - 7$$

5. Identify the slope and y -intercept of each of the following equations and then use them to solve the system of equations by graphing. Remember to write your solution in set notation.

a. $3x + y = 12$

$$2y = x - 18$$

b. $y = 2x - 3$

$$-2x - 2y = -6$$

6. Determine the solution to the system of equations by the *addition method*. Write the solution in set notation.

a. $x - 4y = -6$
 $4x - 2y = 4$

b. $2x + 5y = 10$
 $-3x + 2y = 4$

7. Determine the solution to the system of equations by the *substitution method*. Write the solution in set notation.

a. $2x - 3y = 5$
 $x = 7y - 2$

b. $2x + 5y = 3$
 $-4x - 10y = -6$

8. Let x represent the first number and let y represent the second number. Suppose that twice the first number, increased by 5 times the second number results in 12. Further assume the first number equals $-\frac{5}{2}$ of the second number, increased by 6. Use the given conditions to write a system of equations and then solve that system using the substitution method. Write the solution in set notation.

9. Identify each polynomial as a monomial, a binomial or a trinomial. Give the degree of the polynomial.

a. 15

b. $324x^3 - 9y^{192} + 13$

10. Add or subtract the following polynomials:

a. $(15y^3 + 6y - 2) + (15y^2 - 2y^3 + 7)$

b. $(\frac{2}{3}x^3 + \frac{1}{5}x - \frac{3}{4}) - (-\frac{2}{3}x^3 - \frac{3}{4}x + \frac{3}{4})$

11. Multiply the following.

a. $(-3x^2y^6)(5x^2y^{15})$

d. $(3x - 4)(3x + 4)$

b. $-s(t^3 - s^4t + s^5)$

e. $(5x - 6)(2x^2 + 3x - 4)$

c. $(3x^2 - 5y)^2$

12. Simplify the following expressions by using the exponent rules gone over in class. Final forms should have only positive exponents.

a. $\frac{x^{100}y^{50}}{x^{25}y^{10}}$

d. $\frac{8x^3+6x^2-2x}{2x}$

b. $(100y)^0$

e. $\left(\frac{4x^5}{2x^2}\right)^{-4}$

c. $\frac{-5x^{-10}y^{-12}z^6}{50x^2y^{-3}z^{-2}}$

f. $\left(\frac{x^2}{y^3}\right)^{-3}$

13. Simplify the following expressions using scientific notation. Write the simplified form in BOTH scientific AND decimal notation.

a. $(3 \times 10^4)(3 \times 10^2)$

b. $\frac{180 \times 10^6}{2 \times 10^3}$

c. $(5 \times 10^2)^3$

14. Simplify the following expressions involving radicals.

a. $\sqrt{144 + 25}$

e. $\sqrt{72y^{100}}$

b. $\sqrt[4]{-16}$

f. $\sqrt{\frac{2x}{9}} \cdot \sqrt{\frac{9}{2}}$

c. $\sqrt[3]{\frac{1}{125}}$

g. $\sqrt{\frac{400x^{10}}{10x^3}}$

d. $\sqrt[3]{-1000}$

h. $\sqrt{3^{41}x^{102}y^{17}}$

15. Rationalize and simplify the following expressions.

a. $\frac{3}{\sqrt{5}}$

c. $\frac{x}{4\sqrt{2}}$

b. $\frac{2x}{\sqrt{6}}$

d. $\frac{6x^2}{8x^{-3}\sqrt{18}}$

16. Factor the GCF out of the following polynomials.

a. $5x^2 - 35x$

b. $2x^3(a + 1) - 4x^2(a + 1) - 2x(a + 1)$

17. Factor the following trinomials by unfoiling.

a. $x^2 - 5x - 14$

b. $y^2 + 3x - 10$

18. Factor the following trinomials using the AC method.

a. $2x^2 - x - 6$

b. $6x^2 - 23x + 20$

□ 19. Factor the following special form polynomials.

a. $49z^2 - y^4$

c. $27 - y^3$

b. $16x^2 + 40xy + 25y^2$

d. $64x^3 + 125$

□ 20. Completely factor the following polynomials or state that they are prime.

a. $12x^3 + 36x^2y + 27xy^2$

e. $y^7 + y$

b. $x^3 + 3x^2 - 25x - 75$

f. $25a^2 + 25ab + 6b^2$

c. $6x^2 - 6x - 12$

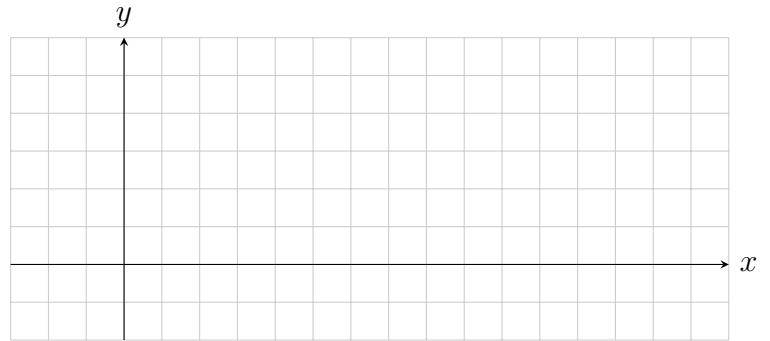
g. $35w^2 - 2w - 1$

d. $16a^3b^2 - 4ab^2$

h. $16x^4y - y^5$

21. Fill in the following table and then graph the equation $y = \sqrt{x+2}$. Finally, does the graph extend to values of x which are less than -2? Explain your reasoning.

x	$y = \sqrt{x+2}$	(x, y)
-2		
-1		
2		
7		
14		



22. *This problem will be in the calculator portion of the exam.* The Andromeda Galaxy is approximately 2.54×10^6 light years from the Milky Way Galaxy that we live in. Now, a light years is NOT a measure of time, it is a measure of DISTANCE. In fact, 1 light year is approximately 9.46×10^{15} meters. Use this information to determine approximately how many meters the Andromeda Galaxy is from the Milky Way Galaxy. Do your calculations and write your answer in scientific notation.

Solve the following story problems involving systems of equations by following these steps:

Step 1: Define variables to be the unknown quantities.

Step 2: Write a system of equations that model's the problem's conditions.

Step 3: Solve the system of equations.

Step 4: Write a conclusion which answers the story problem using complete sentences.

- (a) A rectangular lot is being fenced on three sides. The fencing along the lot's length costs \$22 per foot while the fencing along the two side widths costs \$8 per foot. The total fencing comes out to 170ft while the cost of the fencing along the three sides comes to \$2340. What are the lot's dimensions?

- (b) You are choosing between memberships between Outdoor Store and Adventure Warehouse. Outdoor Store offers an annual membership fee of \$111 which allows you to pay only 80% of the retail price. Adventure Warehouse offers an annual membership fee of \$75 but you pay only 85% of the retail price. What is the retail price of merchandise which would allow you to end up spending the same total amount (including membership fee) at either store? What would that total amount be?