

1. What does the graph of parabola represent?

2. Identify the slope and y -intercept of the following equations and then use them to solve the system of equations by graphing. Remember to label the y -intercepts and the intersection of the lines. Write your solution in set notation.

$$y = -2x + 5$$

$$-2x + 6y = -12$$

3. Solve the system by the addition method. Write the solution in set notation and show a check.

$$2x - 5y = 6$$

$$-3x - 2y = 10$$

4. Let x represent the first number and let y represent the second number. Suppose that twice the first number, increased by 7 times the second number results in 22. Further assume the first number equals 4 times the second number, decreased by 4. 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.

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

a. $-19x$

b. $5x^4 + 11 - 7y^{35}$

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

a. $(-21x^3)^0$

c. $\frac{15x^3 + 35x^7 - 10x^5}{5x^3}$

b. $\frac{-22x^{10}y^{15}z^{12}}{11x^7y^{23}z^{21}}$

d. $\left(\frac{28x^2}{7x^3}\right)^{-3}$

7. Multiply the following by **using the correct form when appropriate** and the FOIL method or the "fast" multiplication when no form is present.

a. $-3x^2(x^3 - 12x^4 + 8x^5)$

c. $(11x - 5)(11x + 5)$

b. $(7y^2 - 12)^2$

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

8. Simplify the following expressions using scientific notation. Write the simplified form in scientific notation.

a. $(2 \times 10^8)(3 \times 10^{-15})$

c. $(3 \times 10^7)^4$

b. $\frac{12 \times 10^{-7}}{48 \times 10^6}$

9. Simplify the following expressions involving radicals.

a. $\sqrt[4]{-64}$

c. $\sqrt{\frac{4x^2}{12}} \cdot \sqrt{\frac{12}{2}}$

b. $\sqrt[3]{-8}$

d. $\sqrt{25x^{35}y^{22}}$

10. Factor the GCF out of the following polynomials.

a. $12x^3 + 24x$

b. $7x^4(x - 2) - 14x^2(x - 2)$

11. Factor the following trinomials by unfoiling.

a. $x^2 + 10x + 24$

b. $x^2 - x - 20$

12. Factor the following polynomials using the AC method.

a. $4x^2 + 4x - 15$

b. $6x^2 - 7x + 2$

13. Factor the following special form polynomials.

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

c. $27 - y^3$

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

d. $64x^3 + 125$

14. 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. $16x^4y - y^5$

15. Solve the following quadratic equations by factoring and using the zero product principle.

a. $4 = 2x^2 - 7x$

b. $0 = 4x^2 - 36$

16. Solve the following quadratic equations using the square root property.

a. $(x - 7)^2 = 16$

b. $(x + 4)^2 = 7$

17. Solve the following quadratic equations using the quadratic formula.

a. $3x^2 - x = -5$

b. $6x^2 = x + 1$

18. Solve each of the following quadratic equations. If there are no real solutions, so state.

a. $(2x - 5)(x + 1) = 2$

c. $9 - 6x + x^2 = 0$

b. $(2x + 7)^2 = 25$

d. $3x^2 - 27 = 0$

19. Determine the domain and range of each of the following relationships and state whether or not we may consider it a function.

a. $\{(1, 6), (2, 6), (3, 8), (4, 9)\}$

b. $\{(6, 1), (6, 2), (8, 3), (9, 4)\}$

20. Given $g(x) = x^2 + 3x + 5$, find each of the following:

a. $g(2)$

d. $g(0)$

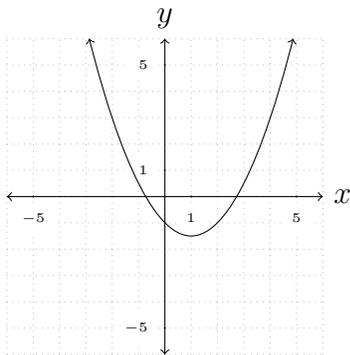
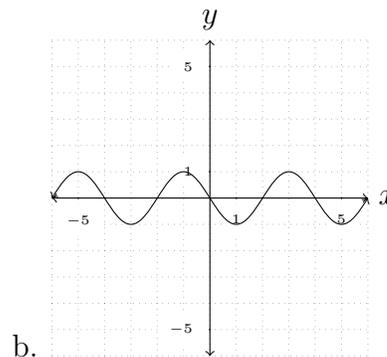
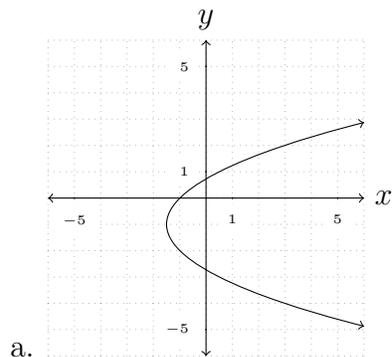
b. $g(-3)$

e. $g(-1)$

c. If $g(x) = 3$, what is x ?

f. If $g(x) = 9$, what is x ?

21. Which of the following graphs represent functions? Give your reasoning.



a. What is $f(4)$?

b. If $f(x) = -1$, what is x ?

22. Figure (22) $f(x) = y$

23. Fill in the following table and then graph the equation $y = \sqrt{x+1}$. Please label the points from the table on the graph.

x	$y = \sqrt{x+1}$	(x, y)
-1		
0		
3		
8		

24. In the above problem, would it have made sense to have x values less than -1? Why or why not?

25. Let $f(x) = -2x^2 + 8x - 6$.

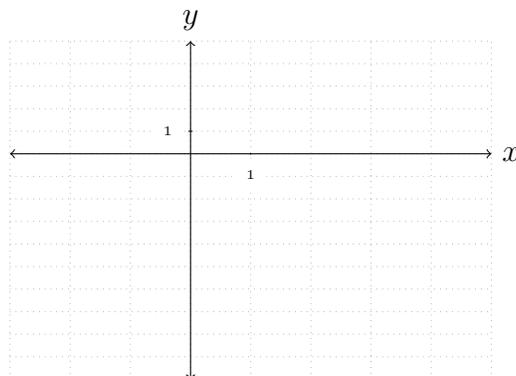
I) State whether the graph opens up or down.

II) Determine and explicitly state what the x and y intercepts of the function are.

III) Determine and explicitly state the vertex and axis of symmetry for the function.

IV) State the y -intercept's mirror point.

V) Graph the function.



26. Light traveling from the Messier 83 Galaxy takes approximately 4.73×10^{14} seconds to reach earth. The speed of light is approximately 3.00×10^8 meters per second. Use this information to determine approximately how many meters the Messier 83 Galaxy is from earth. Do your calculations in scientific notation and give your conclusion using 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.

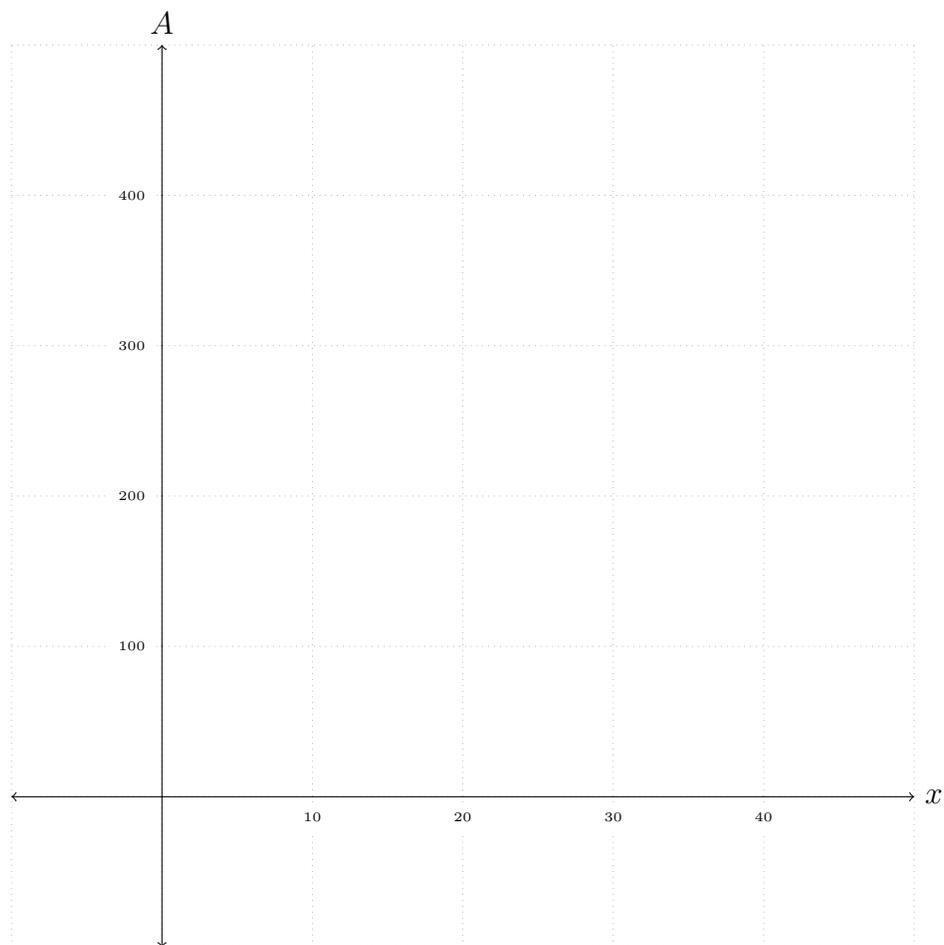
Step 4: Write a conclusion which answers the story problem using complete sentences.

27. In a discount clothing store, all jeans are sold at one fixed price and all t-shirts are sold at another fixed price. If 6 pairs of jeans and 4 t-shirts cost \$180, while 2 pairs of jeans and 7 t-shirts cost \$128, find the price of one pair of jeans and the price of one t-shirt.

28. You are choosing between memberships offered at Outdoor Store and Adventure Warehouse. Outdoor Store offers merchandise at 85% of retail price for an annual membership fee of \$100. Adventure Warehouse offers merchandise at 80% of retail price for an annual membership fee of \$141. 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?

29. Suppose you have 80 yards of fencing to enclose a rectangular area. Let x be the length and w be the width of the plot of land you are fencing.
- Draw a picture of this situation and then write an equation relating the perimeter, length and width.
 - Solve for w in the equation you found in (a) then plug it into $A(x) = x \cdot w$. Then rewrite $A(x)$ in the form $A(x) = ax^2 + bx + c$.
 - $A(x) = y$ graphs as a parabola. Follow the next steps in order to graph $A(x)$.
 - State whether the graph opens up or down.
 - Determine and explicitly state what the x and y intercepts of the function are.
 - Determine and explicitly state the vertex and axis of symmetry for the function.
 - State the y -intercept's mirror point.

V) Graph the function.



d. What is the maximum area that can be enclosed by the fence?

e. What are the dimensions (both x and w) of the rectangle with this maximum area?