

**Standard 5: Students use algebraic concepts, functions, patterns, and relationships to solve problems.**

*Directions: Select the best choice for each of the following questions.*

1. Find the tenth term of the arithmetic sequence 62, 58, 54, ... (Standard 9-10.5.1)

- a. 22                      b. 26                      c. 18                      d. none of these

2. Given the formula for a geometric sequence  $t_n = 4(1.5)^n$ , find the second term of the sequence. (Standard 9-10.5.1)

- a. 36                      b. 6                      c. 9                      d. none of these

3. Determine whether the relation is a function. (Standard 9-10.5.3)

Input	Output
0	5
3	8
6	11
3	14

- a. function                      b. relation                      c. not enough information

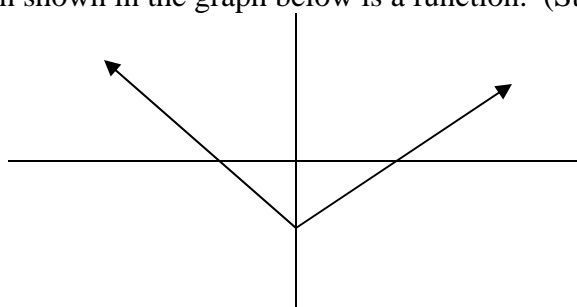
4. Determine whether the relation given by the equation  $y = x^2 + 1$  is a function. (Standard 9-10.5.3)

- a. function                      b. relation                      c. not enough information

5. Determine whether the relation given by the set of ordered pairs below is a function. (Standard 9-10.5.3)  
{ (1, 3)(3, 5) (5, 7) (7, 9) }

- a. function                      b. relation                      c. not enough information

6. Determine whether the relation shown in the graph below is a function. (Standard 9-10.5.3)



- a. function                      b. relation                      c. not enough information

7. If  $f(x) = 3x - 1$  and  $g(x) = x + 5$ , find  $f(x) - g(x)$ . (Standard 9-10.5.4)

- a.  $f(x) - g(x) = 4x + 4$                       b.  $f(x) - g(x) = 2x - 6$                       c. not enough information

8. Determine the domain of the function  $h(x) = |x|$ . (Standard 9-10.5.5)

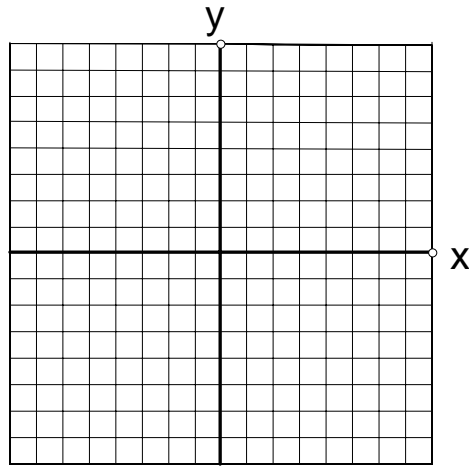
- a. {all real numbers}
- b. {all real numbers greater than or equal to zero}
- c. {all real numbers less than zero}
- d. none of these

9. Determine the range of the function  $h(x) = |x|$ . (Standard 9-10.5.5)

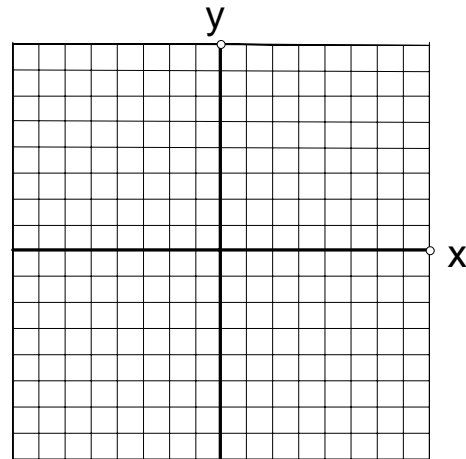
- a. {all real numbers}
- b. {all real numbers greater than or equal to zero}
- c. {all real numbers less than zero}
- d. none of these

*Directions: Answer each of the following problems.*

10. Graph the function  $f(x) = 1 - 2x$ . (Standard 9-10.5.6)



11. Graph the function  $g(x) = x^2 + 1$ . (Standard 9-10.5.6)



12. Mary makes a mixture of dried apples costing \$6.00 per kilogram and dried apricots costing \$8.00 per kilogram. If Mary purchases enough ingredients to make 10 kilograms, write an expression to represent the total cost of the materials. Let  $x$  = the amount of dried apples purchased. (Standard 9-10.5.7)

13. Jesse finished a 200 meter dash in 35 seconds. Let  $r$  represent any rate of speed in meters per second faster than Jesse's. Write an inequality that describes  $r$ . (Standard 9-10.5.7)

14. Simplify:  $3(2x^3 - x + 4) - 2(x^2 + x - 5)$ . (Standard 9-10.5.8)

15. Factor:  $3x^2 - 5x - 2$ . (Standard 9-10.5.8)

16. Solve:  $8x - 4 = 20 - 4x$ . (Standard 9-10.5.9)

17. Graph the solution of problem #16. (Standard 9-20.5.12)

18. Solve:  $24y - 2(6 - y) = 6(3y + 2)$ . (Standard 9-10.5.9)

19. Solve:  $11 - 2x > -5$ . (Standard 9-10.5.9)

20. Graph the solution of problem #19. (Standard 9-10.5.12)

21. Solve:  $7 < 3x - 8 < 19$ . (Standard 9-10.5.9)

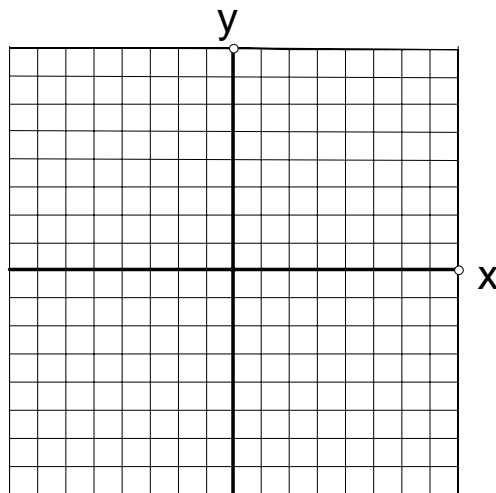
22. Graph the solution of problem #21. (Standard 9-10.5.12)

23. Solve:  $7x - 4y = 10$  (Standard 9-10.5.9)  
 $x - 6y = -4$

24. Graph and check to solve the linear system. (Standard 9-10.5.12)

$$x + y = 10$$

$$x - y = -2$$

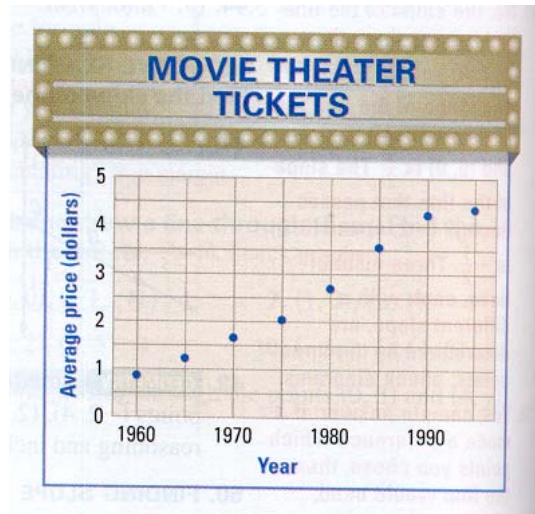


25. Use the Quadratic Formula to solve the equation  $4x^2 - 13x + 3 = 0$ . (Standard 9-10.5.9)

26. Solve the equation by factoring:  $2x^2 + 7x + 3 = 0$ . (Standard 9-10.5.9)

27. The formula  $A = p + prt$  is an equation to determine the amount due (A) for a loan. Solve the equation for time t. The variables p and r represent principal and interest rate. (Standard 9-10.5.10)

28. The graph below shows the price of a movie ticket at the Midtown Theater for the years 1960-1995. Estimate the rate of change from 1960 to 1995 in the price in dollars per year.—McDougal-Littell Algebra 1 page 232. (Standard 9-10.5.15)



29. Use the graph in problem #28 to estimate the cost of going to a movie at the Midtown Theater in 2005. (Standard 9-10.5.15)

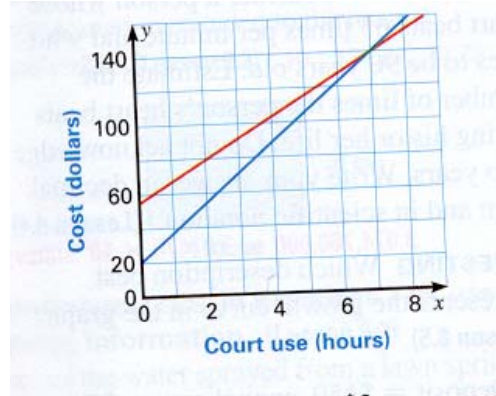
30. The table shows the number of shots on goal and the number of goals scored by players on an ice hockey team during one season.

Shots	Goals
64	11
39	6
38	5
43	7
46	7
28	4
51	7
35	6
28	3

Make a scatter plot that shows the number of shots on goal and the number of goals scored for the players. Use the horizontal axis to represent the number of shots on goal.—McDougal-Littell Algebra 1 page 818. (Standard 9-10.3.1)

31. What conclusions (if any) can you make from the scatter plot you constructed in problem #30. (Standard 9-10.5.14)

32. A tennis club charges \$55 for a summer membership plus \$12 for each hour of court use. A second club charges \$20 for a summer membership plus \$17 for each hour of court use. Use the graph below to determine the number of hours of court use for which the total cost of playing tennis at each club is the same.—  
 McDougal—Littell Algebra 1 page 821. (Standard 9-10.5.13)



33. Using the graph in problem #32, what conclusions can you draw from the information that the graph provides. (Standard 9-10.5.14)

34. Find the rate of change for the table below. The table provides information about how far a caterpillar moves in inches (y) from a starting line. The measurements were done at given times (x) in minutes. (Standard 9-10.5.15)

in minutes (x)	in inches (y)
2	2
9	23