



# Pre-Calculus

Week # 1

## Chapter 1 Test, Form 2A

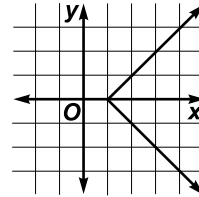
1. State the domain and range of the relation  $\{(-2, -1), (0, 0), (1, 0), (2, 1), (-1, 2)\}$ . Then state whether the relation is a function. Write *yes* or *no*.

1. \_\_\_\_\_

2. If  $f(x) = 2x^2 - x$ , find  $f(x + h)$ .

2. \_\_\_\_\_

3. State the domain and range of the relation whose graph is shown. Then state whether the relation is a function. Write *yes* or *no*.



3. \_\_\_\_\_

Given  $f(x) = x - 3$  and  $g(x) = \frac{1}{x^2 - 9}$ , find each function.

4.  $(f \cdot g)(x)$

4. \_\_\_\_\_

5.  $[g \circ f](x)$

5. \_\_\_\_\_

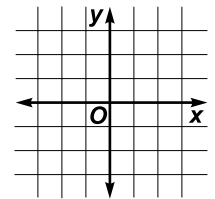
6. Find the zero of  $f(x) = 4x + \frac{2}{3}$ .

6. \_\_\_\_\_

Graph each equation.

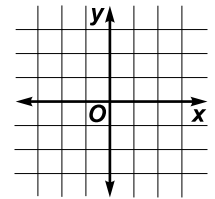
7.  $4y + 8 = 0$

7. \_\_\_\_\_



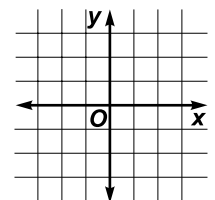
8.  $y = -\frac{1}{3}x + 2$

8. \_\_\_\_\_



9.  $3x - 2y - 2 = 0$

9. \_\_\_\_\_



10. **Depreciation** A car that sold for \$18,600 new in 1993 is valued at \$6000 in 1999. Find the slope of the line through the points at (1993, 18,600) and (1999, 6000). What does this slope represent?

10. \_\_\_\_\_

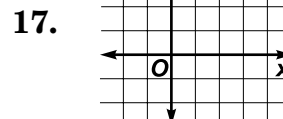
## Chapter 1 Test, Form 2A (continued)

11. Write an equation in slope-intercept form for a line that passes through the point  $C(-2, 3)$  and has a slope of  $\frac{2}{3}$ . 11. \_\_\_\_\_
12. Write an equation in standard form for a line passing through  $A(2, 1)$  and  $B(-4, 3)$ . 12. \_\_\_\_\_
13. Determine whether the graphs of  $4x - y + 2 = 0$  and  $2y = 8x + 4$  are *parallel*, *coinciding*, *perpendicular*, or *none of these*. 13. \_\_\_\_\_
14. Write the slope-intercept form of the equation of the line that passes through  $C(2, -3)$  and is parallel to the graph of  $3x - 2y - 6 = 0$ . 14. \_\_\_\_\_
15. Write the standard form of the equation of the line that passes through  $C(3, 4)$  and is perpendicular to the line that passes through  $E(4, 1)$  and  $F(-2, 4)$ . 15. \_\_\_\_\_
16. The table displays data for a toy store's sales of a specific toy over a six-month period. Write the prediction equation in slope-intercept form for the best-fit line. Use the points  $(1, 47)$  and  $(6, 32)$ . 16. \_\_\_\_\_

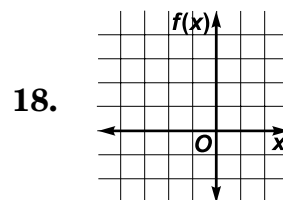
Month	1	2	3	4	5	6
Number of Toys Sold	47	42	43	38	37	32

**Graph each function.**

17.  $f(x) = 2|x - 1| - 2$

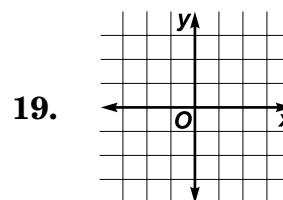


18.  $f(x) = \begin{cases} x + 3 & \text{if } x < 0 \\ 2x & \text{if } x \geq 0 \end{cases}$

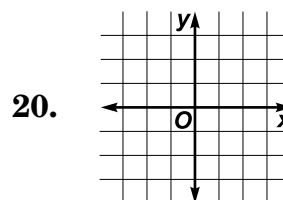


**Graph each inequality.**

19.  $-2 \leq x - 2y \leq 4$



20.  $y < -|x + 1| + 2$

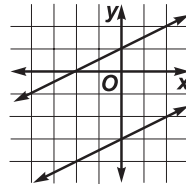


**Bonus** If  $f(x) = \sqrt{x + 2}$  and  $(f \circ g)(x) = |x|$ , find  $g(x)$ .

**Bonus:** \_\_\_\_\_

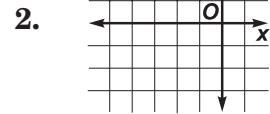
## Chapter 2 Test, Form 2A

1. Identify the system shown by the graph as consistent and independent, consistent and dependent, or inconsistent.



1. \_\_\_\_\_

2. Solve by graphing.  
 $6 + y = -3x$   
 $2x + 6y + 4 = 0$



2. \_\_\_\_\_

3. Solve algebraically.  $4x - y = -3$   
 $5x + 2y = 1$

3. \_\_\_\_\_

4. Solve algebraically.  $-3x + y + z = 2$   
 $5x + 2y - 4z = 21$   
 $x - 3y - 7z = -10$

4. \_\_\_\_\_

**Use matrices  $J$ ,  $K$ , and  $L$  to evaluate each expression. If the matrix does not exist, write impossible.**

$$J = \begin{bmatrix} -5 & 4 \\ 2 & -3 \\ 6 & 1 \end{bmatrix} \quad K = \begin{bmatrix} -8 & 5 & -1 \\ 3 & 2 & 0 \end{bmatrix} \quad L = \begin{bmatrix} -4 & 2 & 3 \\ 7 & -2 & -1 \end{bmatrix}$$

5. \_\_\_\_\_

6. \_\_\_\_\_

5.  $-2K + L$

6.  $3K - J$

7.  $JL$

7. \_\_\_\_\_

8. For what values of  $x$ ,  $y$ , and  $z$  is  $\begin{bmatrix} 2 - 2x \\ -3z + 4x \\ 9z - 6 \end{bmatrix} = \begin{bmatrix} y \\ 0 \\ -4y \end{bmatrix}$  true?

8. \_\_\_\_\_

9. A triangle with vertices  $A(-3, 4)$ ,  $B(5, -2)$ , and  $C(7, -4)$  is rotated  $90^\circ$  counterclockwise about the origin. Find the coordinates of  $A'$ ,  $B'$ , and  $C'$ .

9. \_\_\_\_\_

10. Find the value of  $\begin{vmatrix} 4 & -3 & 1 \\ 7 & 2 & -5 \\ -1 & 1 & 3 \end{vmatrix}$ .

10. \_\_\_\_\_

11. If it exists, find  $A^{-1}$  if  $A = \begin{bmatrix} -3 & 7 \\ 5 & 1 \end{bmatrix}$ .

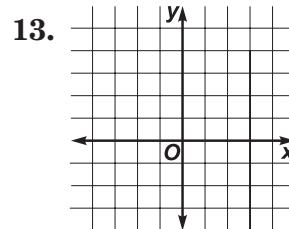
11. \_\_\_\_\_

## Chapter 2 Test, Form 2A (continued)

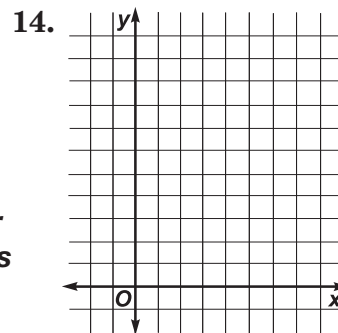
12. Write the matrix product that represents the solution to the system.
- $$4x + 3y = -1$$
- $$5x - 2y = 3$$
12. \_\_\_\_\_

**Solve each system of inequalities by graphing and name the vertices of each polygonal convex set. Then, find the maximum and minimum values for each set.**

13.  $y \leq 5$   
 $x \leq 3$   
 $3y + 4x \geq 0$   
 $f(x, y) = 2x - y + 1$



14.  $y \geq 0$   
 $0 \leq x \leq 4$   
 $-x + y \leq 6$   
 $f(x, y) = 3x - 5y$



**Solve each problem, if possible. If not possible, state whether the problem is infeasible, has alternate optimal solutions, or is unbounded.**

15. The BJ Electrical Company needs to hire master electricians and apprentices for a one-week project. Master electricians receive a salary of \$750 per week and apprentices receive \$350 per week. As part of its contract, the company has agreed to hire at least 30 workers. The local Building Safety Council recommends that each master electrician allow 3 hours for inspection time during the project. This project should require at least 24 hours of inspection time. How many workers of each type should be hired to meet the safety requirements, but minimize the payroll?
15. \_\_\_\_\_
16. A company makes two models of light fixtures, A and B, each of which must be assembled and packed. The time required to assemble model A is 12 minutes, and model B takes 18 minutes. It takes 2 minutes to package model A and 1 minute to package model B. Each week, 240 hours are available for assembly time and 20 hours for packing.
- a. If model A sells for \$1.50 and model B sells for \$1.70, how many of each model should be made to obtain the maximum weekly profit?
- 16a. \_\_\_\_\_
- b. What is the maximum weekly profit?
- 16b. \_\_\_\_\_

**Bonus** Use a matrix equation to find the value of  $x$  for the system.

$$ax + by = c$$

$$dx + ey = f$$

**Bonus:** \_\_\_\_\_