

1. (a) **Solve** the inequality $|x - 3| \leq 7$.

(b) **Graph** the solution to the inequality in (a), above.

2. Write the set $\{x \mid 2 \leq x\}$ in **interval notation**.

3. **State** if the number is **rational** or **irrational**. If the number is rational, write it as a **reduced fraction**. If irrational, find a calculator **approximation**.

(a) $\sqrt{0.625}$ _____

(b) $\sqrt{0.0625}$ _____

4. Name the **property** illustrated in each example.

(a) $x + y = y + x$ _____

(b) $5(ab) = (5a)b$ _____

5. Given the equation $2x + 7y = 28$, find (a) the **x-intercept** (b) the **y-intercept**

(c) one additional point

(d) the **graph**, with the intercepts and the additional point with coordinates.

6. Given the two points $(-2, 5)$ and $(8, -1)$ find (a) the **distance** between them

(b) the **midpoint** of the line segment joining them

(c) the **slope** of the straight line through them

7. Find $f\left(\frac{-3}{2}\right)$ if $f(x) = 2x^2 + 5x - 6$

8. (a) **Solve** the equation $4x - 5 = -3(3 - 2x) + 16$

(b) **Check** your answer to the equation, or check if 2 is a solution or not.

In all word problems, set up an appropriate algebraic equation, solve it, check, and answer with a sentence.

11. Monty starts walking South at 12 noon, at a rate 3 miles per hour. Mike starts at the same place at 1 pm that day and runs after Monty at a rate of 5 miles per hour. What time is it when Mike catches up with Monty, and how far have they gone?

GO TO PAGE 2.

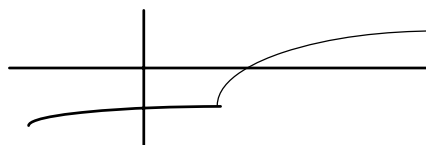
12. How much of a 20% acid solution and a 36% acid solution should be mixed to make 128 ml of a 25% acid solution?
13. Sam is offered a choice of \$550 per month, plus 10% of sales, or \$740 per month, plus 8% of sales. Find the sales amount at which each choice would yield the same salary. State what this salary is.
14. Determine if each of the relations below is a **function or not**, giving a **valid reason** in each case.

(a) $\{(5, 7), (1, 4), (2, 8), (5, 3)\}$

(b) $3x + 4|y| = 64$

(c) $x^2 + y^7 = 1$

(d)



15. $f(x) = x^2 + 2x - 6$ Compute (a) $f(0)$ (b) $f(-3)$

16. Graph the inequality $7x + 4y > 14$ in the plane.

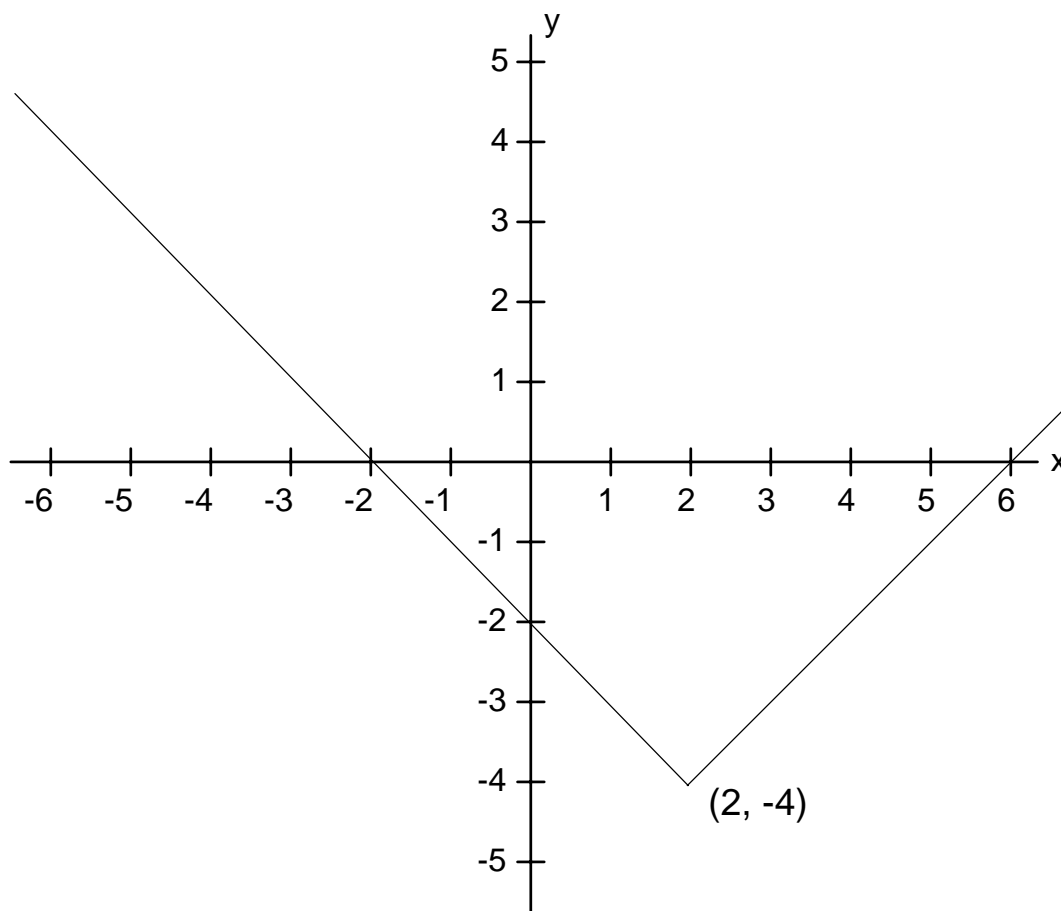
17. Compute the determinant $\begin{vmatrix} -5 & 3 \\ 7 & -6 \end{vmatrix}$. (Topic not always covered.)

18. **Solve** the system $\begin{cases} -5x + 3y = 7 \\ 7x - 6y = -11 \end{cases}$ by **matrices** or by **Cramer's Rule** and **check** your answer.

19. A straight line contains the two points $(-3, 6)$ and $(3, -2)$. Find

- (a) the **slope** of the line (b) the slope-intercept **equation** of the line

20. Find an equation for the curve graphed below. It is made by shifting the graph of the relation $y = |x|$



GO TO PAGE 4.

$$7x + 2y + 3z = 0$$

21. **Solve** the system $4x + 3y + 2z = 8$
 $3x + 5y + 2z = 21$ by **matrices**, or by the **addition** method,

or by **Cramer's Rule**. **Check** your answer.

22. **Set up** a system of **two** equations in **two** variables to solve the problem:

“How much of a 5% solution and an 8% solution should be mixed to make 3.5 liters of a 6% solution?” (Set up only.)

23. The system $4x + 5y = 25$
 $3x + 8y = 23$ has solution $x = 5$, $y = 1$. State

(a) the **matrix** representing the system

(b) the **reduced row echelon form** of the matrix in (a)

24. Evaluate the determinant $\begin{vmatrix} 7 & 3 & 4 \\ 8 & 4 & 5 \\ 5 & 2 & 3 \end{vmatrix}$. (Topic not always covered.)

25. Find the **reduced row echelon** matrix for $\begin{pmatrix} 7 & 3 & 4 & 11 \\ 8 & 4 & 5 & 11 \\ 5 & 2 & 3 & 8 \end{pmatrix}$.

$$7x + 3y + 4z = 11$$

26. Solve the system $8x + 4y + 5z = 11$ by using the result of the previous

$$5x + 2y + 3z = 8$$

problem, and check your answer.