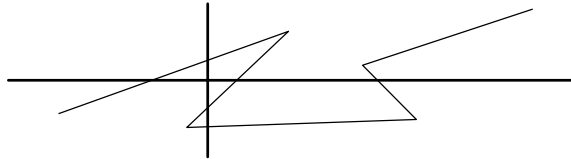


1. Determine if each of the relations below is a **function or not**, giving a detailed, **valid reason** in each case.

(a)  $\{(5, 8), (3, 8), (6, 2), (1, 9)\}$

(b)  $x + y^2 = 1$

(c)



2. (a) If  $f(x) = 3x^2 - 5x + 4$ , compute  $f(-5)$ , showing correct substitution.  
(b) State the **domain** of the relation  $\{(5, 8), (3, 8), (6, 2), (1, 9)\}$   
(c) State the **range** of the relation  $\{(5, 8), (3, 8), (6, 2), (1, 9)\}$

3. Use the **addition** method to solve the system of equations, if possible.  
**Check** the solution, if there is one.

(a) 
$$\begin{aligned} 8x + 5y &= 7 \\ 2x - 3y &= 6 \end{aligned}$$

(b) 
$$\begin{aligned} -4x + 6y &= 5 \\ 2x - 3y &= 6 \end{aligned}$$

4. (a) Find a **calculator approximation** for  $\sqrt{450}$

(b) **Simplify**  $\sqrt{450}$

- (c) A right triangle has sides of lengths 9.60 m and 8.30 m forming the right angle. Find the length of the **hypotenuse**, rounded to two decimal places.

5. **Solve** the equation  $\sqrt{6x + 1} = 9 - x$ . Be sure to **check**.

6. **Rationalize the denominator** and simplify.

(a)  $\frac{2\sqrt{10}}{\sqrt{14}}$

(b)  $\frac{\sqrt{11} + 3\sqrt{5}}{\sqrt{11} - \sqrt{5}}$

7. (a) Compute  $\sqrt[4]{81}$

(b) Give your calculator display for  $\sqrt[4]{243}$

(c) Simplify  $\sqrt[4]{243}$

(d) Simplify  $\sqrt[3]{80x^4y^3z^8}$

8. (a) Solve the system of equations by the **substitution method**,  
and **check** your answer.

$$8x - 5y = 2$$

$$y = 3x + 2$$

(b) **Set up a system of two equations in x and y for the following problem:**

“Maria wants to make 5 liters of a 28% alcohol solution. 20% alcohol solution  
and 40% acid solution are available. How much of each should she mix?”  
(Set up only, do not solve.)

9. **Solve** the equation  $x^2 + 16x - 5 = 0$  by **completing the square**.

10. Given the quadratic equation  $3x^2 - 10x + 5 = 0$ ,

(a) compute the **discriminant**

(b) **solve** the equation by using the **quadratic formula**.

11. A right triangle has sides of lengths 7.30 m and 3.50 m forming the right angle.  
Find the length of the **hypotenuse**, rounded to two decimal places.

12. Find the **distance** between the two points:  $(-1, 7)$ ,  $(5, -1)$

13. Simplify  $(81)^{-3/4}$  (Write answer in **fraction** form.)

14. A rectangle has a length 3 meters longer than its width.  
Its area is 154 square meters. Find the dimensions of the rectangle.