

Name: _____

Date: _____

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Simultaneous Equations Worksheet

Solve each pair of equations. Show your working where needed.

1. Solve the following simultaneous equations using the substitution method.

- a) $x + y = 7$
 $x - y = 1$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- b) $2x + y = 10$
 $x - y = 2$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- c) $3x + 2y = 12$
 $x + y = 5$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- d) $4x - y = 3$
 $2x + y = 11$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- e) $5x + 3y = 19$
 $x - 2y = 1$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- f) $7x + 2y = 16$
 $3x - y = 2$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$

2. Solve the following simultaneous equations using the elimination method.

- a) $x + 3y = 12$
 $2x - y = 1$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- b) $4x + 5y = 9$
 $2x - 3y = 7$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- c) $3x - 2y = 8$
 $x + 5y = 16$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- d) $6x + y = 11$
 $3x - 4y = 5$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- e) $5x - 3y = 20$
 $2x + 4y = 8$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- f) $7x + 5y = 34$
 $x - 2y = -5$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$

3. Solve the following simultaneous equations using graphing.

- a) $x + y = 6$
 $x - y = 2$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- b) $2x + y = 8$
 $x - 3y = 1$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- c) $3x + 2y = 12$
 $x - y = 2$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- d) $4x - y = 7$
 $x + 2y = 5$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$

4. Solve the following mixed method questions (use substitution or elimination as suitable).

- a) $x + 2y = 9$
 $3x + y = 14$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- b) $5x - 2y = 1$
 $x + 3y = 13$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- c) $4x + 3y = 18$
 $2x - y = 4$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- d) $7x - 5y = 3$
 $2x + 6y = 12$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$

5. Word Problems

- a) The sum of two numbers is 24 and their difference is 6. Find the numbers.
Answer: _____
- b) A shop sells 3 notebooks and 2 pens for ₹48. Another shop sells 2 notebooks and 5 pens for ₹63. Find the cost of one notebook and one pen.
Answer: _____
- c) The perimeter of a rectangle is 26 cm. Its length is 7 cm more than its width. Find the length and width.
Answer: _____

6. Real Life Situations

- a) Two numbers add up to 50 and their difference is 14. Find the numbers.
Answer: _____
- b) A train travels 240 km in 4 hours and 180 km in 3 hours on the same route. Find the distance it travels per hour in each case. (Use simultaneous equations.)
Answer: _____
- c) A bag of apples and a bag of oranges together weigh 12 kg. The bag of apples is 2 kg heavier than the bag of oranges. Find the weight of each bag.
Answer: _____

7. Challenge Questions

- a) Solve the system: $\begin{cases} 2x + 3y = 13 \\ 3x - 2y = 4 \end{cases}$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- b) Solve the system: $\begin{cases} x^2 + y = 5 \\ x - y = 1 \end{cases}$ $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$
- (Note: The solution is $x = 2$, $y = 1$. Verify it!)

8. Think and Solve

- a) If x and y satisfy $x + y = 8$ and $x - y = 4$, what is the value of x and y ?
Answer: _____
- b) Find two numbers whose sum is 18 and product is 45.
Answer: _____

