Simultaneous Equations

Algebra · 6 questions · step-by-step answers at the end

Name: Date: Score: / 6

USEFUL EQUATIONS

same signs: subtract; different signs: add $y = mx + c$ into the other equation

line and curve ⇒ quadratic in x solution = intersection point

Questions

Show your working in the space under each question.

1. EASY Solve $2x + y = 11$ and $x + y = 7$.

2. EASY Solve $y = 2x$ and $x + y = 12$.

3. MEDIUM Solve $4x - 3y = 5$ and $2x + 5y = 9$.

4. MEDIUM 3 coffees and 2 teas cost $13.50. 2 coffees and 3 teas cost $11.50. Find the price of each.

5. HARD Find where $y = x^2$ meets $y = x + 6$.

6. HARD Solve $x + y = 5$ and $xy = 6$.

Step-by-step answers

Simultaneous Equations

1. Subtract: $x = 4$. Then $y = 3$. **$x = 4, y = 3$**.
2. Substitute: $x + 2x = 12$, so $x = 4$ and $y = 8$. **$x = 4, y = 8$**.
3. Double the second: $4x + 10y = 18$. Subtract the first: $13y = 13$, $y = 1$. Then $4x - 3 = 5$, $x = 2$. **$x = 2, y = 1$**.
4. Add: $5c + 5t = 25$, so $c + t = 5$. Subtract: $c - t = 2$. So **coffee \$3.50, tea \$1.50**.
5. $x^2 = x + 6$, so $x^2 - x - 6 = 0$ and $(x - 3)(x + 2) = 0$. Points **(3, 9) and (−2, 4)**.
6. $y = 5 - x$, so $x(5 - x) = 6$ and $x^2 - 5x + 6 = 0$. $x = 2$ or 3. **(2, 3) or (3, 2)**.