

SOLVING SIMULTANEOUS EQUATIONS

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Lesson Description

In this lesson we will

- Solve simultaneous equations in a variety of contexts



Summary

Simultaneous Equations

In solving simultaneous equations, focus on the linear equation and make one of the variables the subject of the formula (if possible, the variable with a coefficient of one helps to keep one away from fractions)

Substitute the linear equation into the non-linear equation.



Test Yourself

Question 1

Which pair of values of x and y is a solution for $xy = 8$ and $2x + y = 17$

- A. $x = 2; y = 4$
- B. $x = 4; y = 2$
- C. $x = 8; y = 1$
- D. $x = 1; y = 8$

Question 2

Choose the correct answer

Solve the equations $x - 2y = 3$ and $x^2 - 3xy + 3y^2 - 2x + 2y - 5 = 0$ simultaneously:

- A. $x = 5$ or $x = -1$ and $y = 1$ or $y = -2$
- B. $x = 1$ or $x = -1$ and $y = -1$ or $y = -2$
- C. $x = 2$ or $x = -2$ and $y = \frac{-1}{2}$ or $y = -2\frac{1}{2}$
- D. $x = 3$ or $x = -3$ and $y = 0$ or $y = -3$

Question 3

Choose the correct answer

What are the co-ordinates of a point where the solution of the simultaneous equations $y = x^2 - 3x - 5$ and $y = -2x + 1$ can be found?

- A. (0;1)
- B. (0; -5)
- C. $(4\frac{1}{2}; 0)$
- D. (3; -5)

Question 4

Choose the correct answer

If $y = \sqrt{9 - 3x}$, determine the values of x for which y will be a real number

- A. $x < 3$
- B. $x > 3$
- C. $x \geq 3$
- D. $x \leq 3$

Question 5

Choose the correct answer

Solve the equations $y - x - 2 = 0$ and $y - \frac{8}{x} = 0$ simultaneously:

- A. $x = -2$ and $y = -4$ or $x = -4$ and $y = -2$
- B. $x = 2$ and $y = 4$ or $x = -4$ and $y = -2$
- C. $x = 2$ and $y = 4$ or $x = 4$ and $y = 2$
- D. $x = 4$ and $y = 2$ or $x = -2$ and $y = -4$

Question 6

Choose the correct answer

If $x = -a$ and $y = -b$ satisfy the simultaneous equations

$x^2 + y^2 = 25$ and $y - x + 1 = 0$, then

- A. $a^2 + b^2 = 25$ and $-b - a + 1 = 0$
- B. $-a^2 - b^2 = 25$ and $a - b + 1 = 0$
- C. $-a^2 - b^2 = 25$ and $b + a - 1 = 0$
- D. $a^2 + b^2 = 25$ and $a - b + 1 = 0$

Question 7

Choose the correct answer

If $f(x) = \frac{x+1}{x-1}$ and $f(a) = 5$ then $f(2a)$ is equal to...

- A. 10
- B. 8
- C. 2
- D. 6

Question 8

Choose the correct answer

Mariam's shop sells 4 koeksisters for every 5 samoosas. Using K for the number of koeksisters sold and S for the number of samoosas sold, which of the following equations is correct?

- A. $4K = 5S$
- B. $4S = 5K$
- C. $K = 20S$
- D. $9S = 4K$

Question 9

Choose the correct answer

If $x > y$ and $x - 3y = 6$ and $xy = 24$ then $x - y = \dots$

- A. 2
- B. -10
- C. -2
- D. 10

Question 10

Solve the equations $2^x = 8^{y+1}$ and $3^{x-2} = 9^{x-4y}$ simultaneously.



Improve your Skills

Question 1

Solve for x and y :

$2y - x = 3$ and $y^2 - 2x^2 - x = 1$

Question 2

2.1 Solve for $\frac{x}{y}$ if $2\left(\frac{x}{y} - \frac{3y}{2x}\right) + 1 = 0$

2.2 If $a + a^{-1} = 3$, calculate the value of $a^3 + a^{-3}$

Question 3

Solve for x and y

$2^x = 4^{y-3}$ and $x^2 + y^2 = 20$

Question 4

If $5^{-x} = 10m$, express $\frac{2^{x-1} + 2^{x+1}}{5 \cdot 10^x}$ in terms of m