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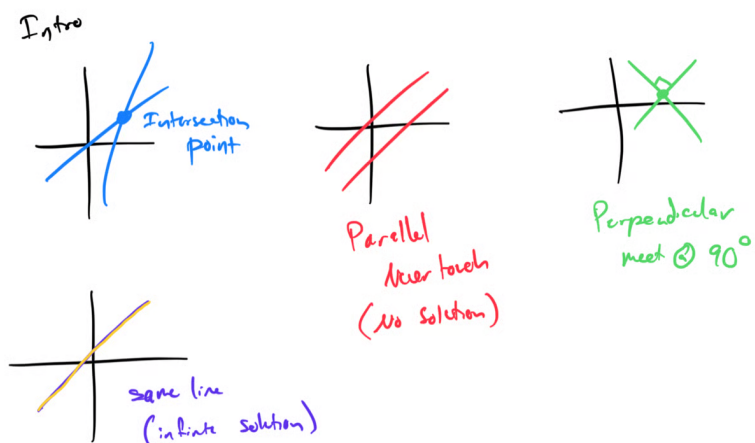
Topic 1: Product rule with positive exponents: Multivariate

1. Simplify the expression $(2x^2y)(3xy^3)$ using the product rule.

$$(2x^2y)(3xy^3)$$

$$6x^3y^4$$

1. Simplify the expression $(4x^3z^2)(5x^2z)$ using the product rule.



Topic 2: Solving a system of linear equations using substitution

1. Solve the system of equations using substitution: $y = 2x + 3$ and $3x + y = 13$.

$$y = 2x + 3$$

$$3x + y = 13$$

$$3x + (2x + 3) = 13$$

$$5x + 3 = 13$$

$$5x = 10$$

$$x = 2$$

Plug it in to

$$y = 2(2) + 3$$

$$y = 7$$

$$(2, 7)$$

$$5x = 10$$

$$x = 2$$

1. Solve the system of equations using substitution: $x = 4y - 1$ and $2x - 3y = 3$.

$$x = 4y - 1$$

$$2x - 3y = 3$$

$$2(4y - 1) - 3y = 3$$

$$8y - 2 - 3y = 3$$

$$5y - 2 = 3$$

$$5y = 5$$

$$y = 1$$

Plug it in x

$$x = 4(1) - 1$$

$$x = 3$$

$$(3, 1)$$

1.

Topic 3: Solving a system of linear equations using elimination with multiplication and addition

1. Solve the system of equations using elimination: $2x + 3y = 10$ and $4x - 5y = -2$.

$$-2(2x + 3y = 10)$$

$$4x - 5y = -2$$

$$+ -4x - 6y = -20$$

$$\hline -11y = -22$$

$$\frac{-11y}{-11} = \frac{-22}{-11}$$

$$y = 2$$

Plug it in x

$$2x + 3(2) = 10$$

$$2x + 6 = 10$$

$$2x = 4$$

$$x = 2$$

$$(2, 2)$$

1. Solve the system of equations using elimination:

$$5(-3x - 4y = 9)$$

$$3(5x + 9y = -15)$$

$$-15x - 20y = 45$$

$$+ 15x + 27y = -45$$

$$\hline 7y = 0$$

$$\frac{7y}{7} = \frac{0}{7}$$

$$y = 0$$

Plug it in x

$$5x + 9(0) = -15$$

$$5x = -15$$

$$x = -3$$

$$(-3, 0)$$

1.

Topic 4: Solving a word problem using a system of linear equations of the form $Ax + By = C$

Miguel the trainer has two solo workout plans that he offers his clients: Plan A and Plan B. Each client does either one or the other (not both). On Wednesday there were 9 clients who did Plan A and 7 who did Plan B. On Thursday there were 3 clients who did Plan A and 5 who did Plan B. Miguel trained his Wednesday clients for a total of 12 hours and his Thursday clients for a total of 6 hours. How long does each of the workout plans last?

Length of each Plan A workout: hour(s)

Length of each Plan B workout: hour(s)



	A	B	total
Wednesday	9	7	12
Thursday	3	5	6

$$\begin{array}{r}
 9x + 7y = 12 \\
 -3(3x + 5y = 6) \\
 \hline
 + -9x - 15y = -18 \\
 \hline
 -8y = -6 \\
 \frac{-8y}{-8} = \frac{-6}{-8} \\
 y = 0.75
 \end{array}$$

Plug into k

$$\begin{aligned}
 3x + 5(0.75) &= 6 \\
 3x + 3.75 &= 6 \\
 3x &= 2.25 \\
 x &= 0.75
 \end{aligned}$$

$(0.75, 0.75)$

A = 0.75
B = 0.75

1. A movie theater charges \$8 for adult tickets and \$5 for child tickets. If 10 tickets were sold for \$71, how many adult and child tickets were purchased?

1.

Topic 5: Solving a system of linear and quadratic equations

1. Solve the system of equations:

$$\begin{aligned}
 y &= x^2 + 6x \\
 -x + y &= 24
 \end{aligned}$$

$$\begin{aligned}
 -x + (x^2 + 6x) &= 24 \\
 x^2 + 5x - 24 &= 0 \\
 (x + 8)(x - 3) &= 0 \\
 x + 8 = 0 & \quad x - 3 = 0 \\
 x = -8 & \quad x = 3
 \end{aligned}$$

Plug into k

$$\begin{aligned}
 x &= -8 \\
 y &= (-8)^2 + 6(-8) \\
 &= 64 - 48 \\
 y &= 16
 \end{aligned}$$

$$\begin{aligned}
 x &= 3 \\
 y &= 3^2 + 6(3) \\
 &= 9 + 18 \\
 y &= 27
 \end{aligned}$$

$(-8, 16)$ & $(3, 27)$

1. Solve the system of equations: $y = x^2 + 2x - 3$ and $y = x + 1$.

