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1. (1 point) Solve the following system:

$$\begin{aligned} -4x+8y &= 0 \\ 12x+3y &= -54 \end{aligned}$$

The solution is:
$x =$ _____
$y =$ _____

Solution: Our first step is to multiply the first equation by $+3$. This yields the system

$$\begin{aligned} -12x+24y &= 0 \\ 12x+3y &= -54 \end{aligned}$$

Adding these two equations, we reduce the problem to solving the linear equation

$$27y = -54$$

which yields the solution $y = -2$. Plugging this back into either of the original equations yields $x = -4$. Thus, the solution is $(x,y) = (-4,-2)$.

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2. (1 point) Solve the following system:

$$\begin{aligned} 5x-8y &= -23 \\ -4x-6y &= 6 \end{aligned}$$

The solution is:
$x =$ _____
$y =$ _____

Solution: Our first step is to solve the first equation for one the variables (let's say we solve for x. We see that

$$x = \frac{-23+8y}{5}.$$

Plugging this into the second equation yields

$$-4 \cdot \frac{-23+8y}{5} - 6y = 6.$$

Finally, simplifying and solving for y ,we see that $y = 1$. Plugging this value back into either one of the original equations yields $x = -3$. Thus, the solution is $(x,y) = (-3,1)$.

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3. (1 point) Solve the folowing system:

$$\begin{aligned} x-2y-z &= -4 \\ y-3x+z &= 3 \\ -2y-z &= 2 \end{aligned}$$

Note: your answers must be fractions (decimals are not allowed).

$x =$ _____
$y =$ _____
$z =$ _____

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4. (1 point) For what value(s) of h is the linear system consistent?

$$\begin{aligned} -6x_1 - 8x_2 &= h \\ 9x_1 + 12x_2 &= -1 \end{aligned}$$

h [select/=/not equal to] _____

Solution: From the the second equation, $9x_1 + 12x_2 = -1$, we obtain $x_1 = -\frac{4}{3}x_2 - \frac{1}{9}$. Substitute into equation 1, $-6\left(-\frac{4}{3}x_2 - \frac{1}{9}\right) - 8x_2 = h \Rightarrow \frac{2}{3} = h$. The system is consistent provided $h = \frac{2}{3}$.