MAT 1340

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1. a) $2x+5y=20$

$\frac{5y}{5} = \frac{20}{5} - \frac{2x}{5}$

$y = 4 - \frac{2x}{5}$

$y = -\frac{2}{5}x + 4$

Slope: $-\frac{2}{5}$

y-intercept: (0,4)

$3x-2y=18$

$\frac{-2y}{-2} = \frac{18}{-2} - \frac{3x}{-2}$

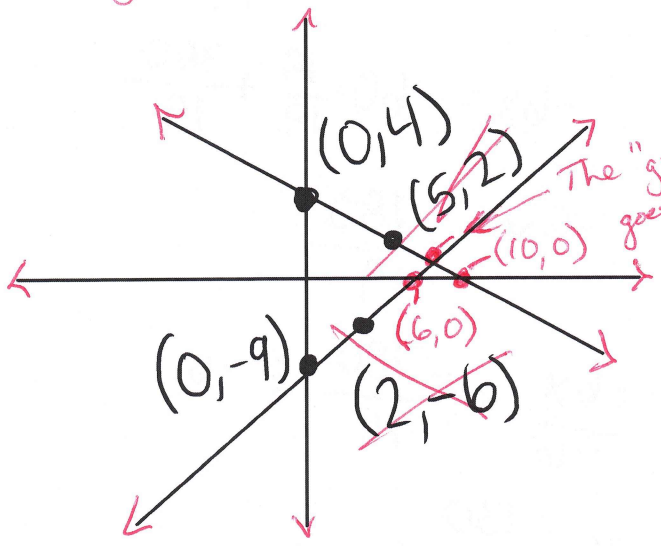
$y = -9 + \frac{3x}{2}$

$y = \frac{3}{2}x - 9$

Slope: $\frac{3}{2}$

y-intercept: (0, -9)

67.5/70 good job! :)



Try this:

$2x + 5y = 20$ and $3x - 2y = 18$

x	y
0	4
10	0

(0,4) (10,0)

x	y
0	-9
6	0

(0,-9) (6,0)

+9

1. b) $2x + 5y = 20$
$3x - 2y = 18$

$\frac{2x}{2} = \frac{20}{2} - \frac{5y}{2}$

$x = 10 - \frac{5y}{2}$

$3(10 - \frac{5y}{2}) - 2y = 18$

$30 - \frac{19y}{2} = 18$

$-30 \quad -30$

$-\frac{19y}{2} = 18 - 30$

$-\frac{19y}{2} = -12$

$-\frac{2}{19} \cdot (\frac{-19y}{2}) = -\frac{2}{19} \cdot (-12)$

$y = \frac{24}{19}$

$x = 10 - \frac{5(\frac{24}{19})}{2}$

$x = \frac{130}{19}$

+10

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1. c)

$(-3)\cdot(2x+5y)=(-3)(20)$

$(2)\cdot(3x-2y)=(2)(18)$

$-6x-15y=-60$

$6x-4y=36$

$$\begin{array}{r} -6x-15y=-60 \\ +\quad 6x-4y=36 \\ \hline -19y=-24 \end{array}$$

$$\frac{-19y}{-19}=\frac{-24}{-19}$$

$$y=\frac{24}{19}$$

$$-6x-15\left(\frac{24}{19}\right)=-60$$

$$-6x-\frac{360}{19}=-60$$

$$+\frac{360}{19} \qquad +\frac{360}{19}$$

$$-6x=-60+\frac{360}{19}$$

$$-6x=-60\cdot\frac{19}{19}+\frac{360}{19}$$

$$-6x=-\frac{780}{19}$$

$$\frac{-6x}{-6}=\frac{-780}{19}\div -6$$

$$x=\frac{130}{19}$$

$$\left(\frac{130}{19},\frac{24}{19}\right)$$

+10

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2. $2x-2y+z=-13$
$3x-5y-z=-21$
$x \quad -2z=7$

$$\begin{array}{r} 2x-2y+z=-13 \\ +\ 3x-5y-z=-21 \\ \hline 5x-7y \quad =-34 \end{array}$$

$$(-2)\cdot(3x-5y-z)=(-2)(-21)$$

$$-6x+10y+2z=42$$

$$\begin{array}{r} -6x+10y+2z=42 \\ +\ x \quad -2z=7 \\ \hline -5x+10y \quad =49 \end{array}$$

$$\begin{array}{r} 5x-7y=-34 \\ +\ -5x+10y=49 \\ \hline 3y=15 \end{array}$$

$$\frac{3y}{3}=\frac{15}{3}$$

$$y=5$$

$$5x-7\cdot 5=-34$$
$$5x-35=-34$$
$$5x=-34+35$$
$$\frac{5x}{5}=\frac{1}{5} \qquad x=\frac{1}{5}$$

$$2\left(\tfrac{1}{5}\right)-2\cdot 5+z=-13$$
$$\frac{2}{5}-10+z=-13$$
$$\frac{2-10\cdot 5}{5}+z=-13$$
$$-\frac{48}{5}+z=-13$$
$$+\frac{48}{5} \qquad +\frac{48}{5}$$
$$z=\frac{-13\cdot 5}{5}+\frac{48}{5}$$

$$z=-\frac{17}{5}$$

$$\left(\tfrac{1}{5}, 5, -\tfrac{17}{5}\right)$$

+10

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3. a)

$$\begin{aligned} 7x+17y+27z&=30\\ 2x+5y+8z&=8\\ x+2y+3z&=6 \end{aligned}$$

$7x = 30-17y-27z$

$\frac{7x}{7} = \frac{30}{7} - \frac{17y}{7} - \frac{27z}{7}$

$x = \frac{30}{7} - \frac{17y}{7} - \frac{27z}{7}$

$2\left(\frac{30}{7} - \frac{17y}{7} - \frac{27z}{7}\right) + 5y + 8z = 8$

$\frac{60}{7} - \frac{34y}{7} - \frac{54z}{7} + 5y + 8z = 8$

$\frac{60}{7} - \frac{54z}{7} - \frac{34y}{7} + 5y \cdot \frac{7}{7} + 8z = 8$

$\frac{60}{7} - \frac{54z}{7} - \frac{34y}{7} + \frac{5y \cdot 7}{7} + 8z = 8$

$\frac{60}{7} - \frac{54z}{7} + \frac{-34y + 5y \cdot 7}{7} + 8z = 8$

$8z + \frac{60 - 54z + y}{7} = 8$

$\frac{8z \cdot 7 + 60 - 54z + y}{7} = 8$

$\frac{2z + 60 + y}{7} \cdot 7 = 8 \cdot 7$

$y + 2z + 60 = 56$

$y = -2z - 4$ ✓

$\frac{30}{7} - \frac{17(-2z-4)}{7} - \frac{27z}{7}$

$x = \frac{30 - 17(-2z-4) - 27z}{7}$

$x = \frac{30 + 34z + 68 - 27z}{7}$

$x = \frac{34z + 98 - 27z}{7}$

$x = \frac{7z + 98}{7}$ ✓

$x = z + 14$ ✓

$y = -2z - 4$ ✓

~~$x + 2y + 3z = 6$~~

z is free

+9.5

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3. b) $x = z + 14$
$y = -2z - 4$

$0 + 14 = 14$ $\quad x = 14$
$y = -4$

$-2(0) - 4 = -4$

$1 + 14 = 15$ $\quad x = 15$
$y = -6$

$-2(1) - 4 = -6$

$-1 + 14 = 13$ $\quad x = 13$
$y = -2$

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

$(14, -4, 0)$, $(15, -6, 1)$,

$(13, -2, -1)$

+10

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4. $7x+17y+27z=30$
$2x+5y+8z=3$
$x+2y+3z=6$

$x+3z=6-2y$

$x=6-2y-3z$

$7(6-2y-3z)+17y+27z=30$
$42-14y-21z+17y+27z=30$
$42+3y+6z=30$

$2(6-2y-3z)+5y+8z=3$
$12-4y-6z+5y+8z=3$
$12+y+2z=3$
$y=-9-2z$

$42+3(-9-2z)+6z=30$
$42-27-6z+6z=30$
$15=30$
↑ absurd!

b/c $15=30$ is absurd, this system of linear eqns has NO solutions.

looking for this.

$x=6-2(-9-2z)-3z$
$x=24+z$

+9