① $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-7-3}{4-2} = \frac{-10}{2} = -5$

② $y = \frac{3}{5}x + 3$

③ $y = \frac{3}{5}(x-4) - 7$ $\quad (4, -7)$

$y = m(x - x_1) + y_1$

$= \frac{3}{5}x - \frac{3}{5}(4) - 7$

$\left(\frac{3}{5}\right)\left(\frac{4}{1}\right) = \frac{12}{5}$

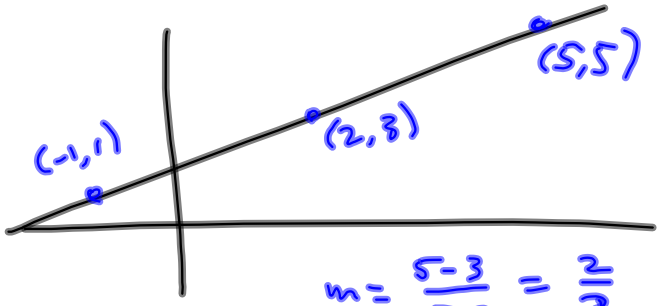
$-\frac{12}{5} - \frac{7}{1}\cdot\frac{5}{5}$

$= -\frac{12}{5} - \frac{35}{5} = -\frac{47}{5}$

④ $y = \frac{3}{5}x - \frac{47}{5}$

$-\frac{3}{5}x + y = -\frac{47}{5}$ $\quad Ax + By = C$

⑤ $-3x + 5y = -47$



$m = \frac{5-3}{5-2} = \frac{2}{3}$

$y = m(x - x_1) + y_1$

$y = \frac{2}{3}(x+1) + 1$

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

$y = \frac{2}{3}(x-5) + 5$

(7) $7x - 3y = 11$

$-3y = -7x + 11$

$y = \frac{-7}{-3}x + \frac{11}{-3}$

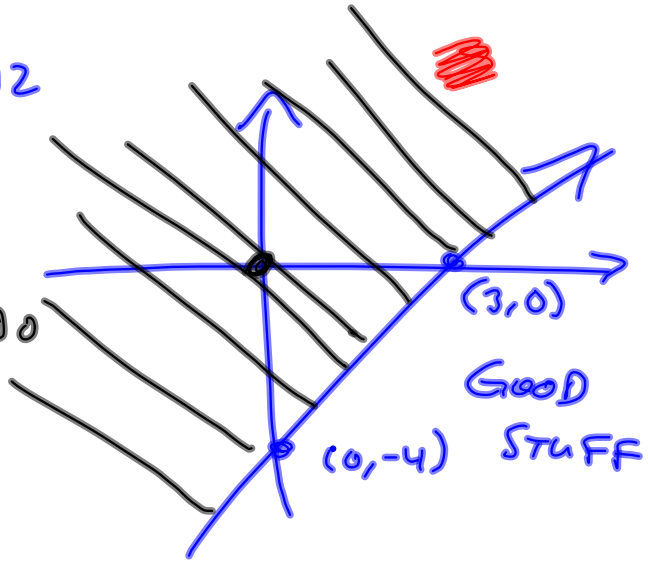
$m = \frac{7}{3}$ (2)

$m_\perp = -\frac{3}{7}$ (6)

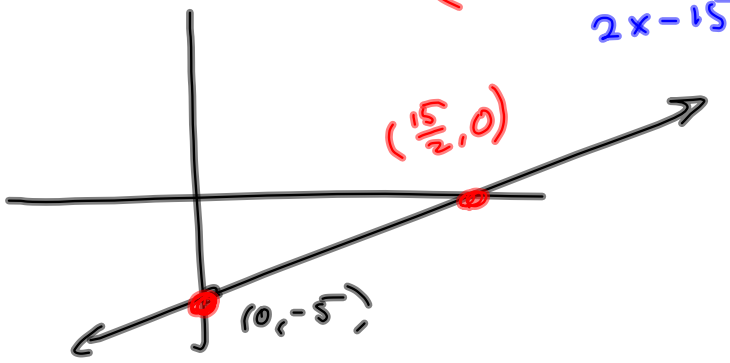
(8) $4x - 3y \geq 12$

x	y
0	-4
3	0

$0 \geq 12$ No



$y = \frac{2}{3}x - 5$



$(3)\left(\frac{2}{3}x - 5 = 0\right)$

$2x - 15 = 0$

$2x = 15$

$x = \frac{15}{2}$

$f + g = x^2 - 3x + 2 + 2x - 7$

$= x^2 - x - 5$

$fg = (x^2 - 3x + 2)(2x - 7)$

$= 2x^3 - 7x^2$

$-6x^2 + 21x$

$4x - 14$

$2x^3 - 13x^2 + 25x - 14$

$\frac{f}{g} = \frac{x^2 - 3x + 2}{2x - 7}$

(d) $f \circ g = f(g(x)) = (2x-7)^2 - 3(2x-7) + 2$

$= 4x^2 - 28x + 49 - 6x + 21 + 2$

$= \boxed{4x^2 - 34x + 72}$

$(a-b)^2 = a^2 - 2ab + b^2$

$(2x)^2 = 2(2x)(7) + 7^2$

$= 4x^2 - 28x + 49$

$f(x) = x^2 - 3x + 2 \Rightarrow$ $f(x+h)$ $\quad f(x)+h$

$$\frac{f(x+h) - f(x)}{h} = \frac{(x+h)^2 - 3(x+h) + 2 - (x^2 - 3x + 2)}{h}$$

$$= \frac{x^2 + 2xh + h^2 - 3x - 3h + 2 - x^2 + 3x - 2}{h}$$

$$= \frac{2xh + h^2 - 3h}{h} = \frac{h(2x + h - 3)}{h} = 2x + h - 3$$

$$y = \frac{xw}{z^2} K$$

$$\frac{4(5)}{2^2} K = 10$$

$$5K = 10$$

$$K = 2$$

$$y = \frac{(7)(3)}{4^2} \cdot 2 = \frac{21}{8}$$

---

(1) $b^2 - 4ac$

(2) $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

(3) $|2x-3| \geq 3$

$2x - 3 \geq 3$ or $2x - 3 \leq -3$

$2x \geq 6$ or $2x \leq 0$

$\{x \mid x \geq 3$ or $x \leq 0\}$

(5) $375x^3 - 24y^9$

$3 \mid 375$, $5 \mid 125$, $5 \mid 25$

$3 \mid 24$, $2 \mid 8$, $2 \mid 4$, 2

$3 \cdot 5^3 x^3 - 3 \cdot 2^3 (y^3)^3$

$= 3\left(5^3 x^3 - 2^3 (y^3)^3\right) = 3\left((5x)^3 - (2y^3)^3\right)$

$= 3(5x - 2y^3)\left((5x)^2 + (5x)(2y^3) + (2y^3)^2\right)$ $y^9 = y^{3\cdot 3} \quad (y^3)^3$

$x^3 - y^3 = (x-y)(x^2 + xy + y^2)$

(6)

(7) $4x^2 - 20x + 17$

$a = 4, b = -20, c = 17$

$b^2 - 4ac = (-20)^2 - 4(4)(17)$

$= 400 - 272$

$= 128 \Rightarrow \sqrt{128} = 8\sqrt{2}$

Bucki

2 | 128
2 | 64
2 | 32
2 | 16
2 | 8
2 | 4
2

$\sqrt{2 \cdot 2^6}$

$= 2^3\sqrt{2}$

$= 8\sqrt{2}$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$= \frac{20 \pm 8\sqrt{2}}{2(4)}$

$= \frac{4(5 \pm 2\sqrt{2})}{2(4)}$

$= \frac{5 \pm 2\sqrt{2}}{2}$

$4\left(x - \left(\frac{5+2\sqrt{2}}{2}\right)\right)\left(x - \left(\frac{5-2\sqrt{2}}{2}\right)\right)$

$= (2x - (5+2\sqrt{2}))(2x - (5-2\sqrt{2}))$

Find where $3x+y=7$ and $2x-3y=6$ intersect

Substitution

$y = -3x+7$

$2x-3(-3x+7)=6$ Solve for x:

$2x+9x-21=6$

$11x-21=6$

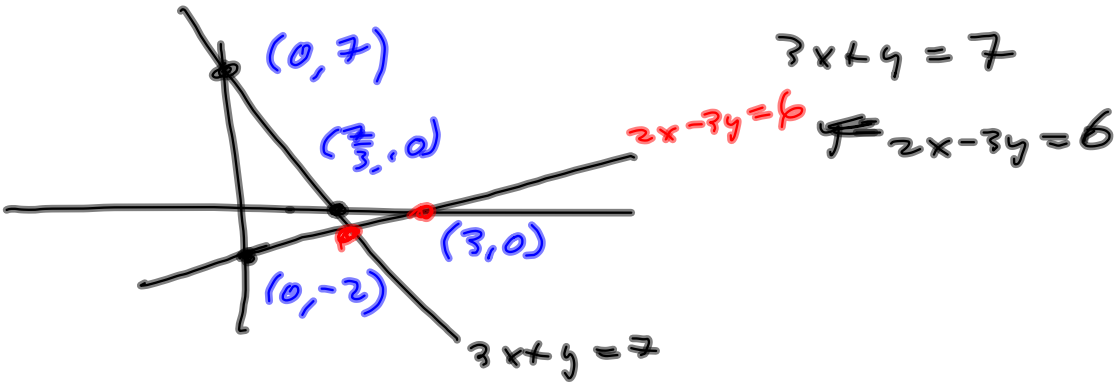
$11x=27$

$x=\frac{27}{11}$

$y=-3x+7$

$=-3\left(\frac{27}{11}\right)+7$

$=-\frac{81}{11}+\frac{77}{11}=-\frac{4}{11}=y$



$3x+y=7$

$2x-3y=6$

Addition / Elimination Method

Not required.

Substitution

(22) S1 4.1

$\left(\frac{1}{2}x + \frac{1}{3}y = \frac{2}{3}\right)(6)$

$(15)\left(\frac{2}{5}x + \frac{2}{5}y = \frac{14}{15}\right)$

LCD: $\frac{1}{2}$ $\frac{1}{3}$ $\frac{2}{3}$

$2 \cdot 3$

$\frac{2}{5}, \frac{2}{5}, \frac{14}{3 \cdot 5}$

LCD $= 3 \cdot 5$

$\left(\frac{6}{1}\right)\left(\frac{x}{2}\right) = 3x$

$\frac{6}{1} \cdot \frac{y}{3}$

$\frac{6}{1} \cdot \frac{2}{3}$

$3x + 2y = 4$

$10x + 6y = 14$

$3x + 2y = 4$

$2y = -3x + 4$

$y = \frac{-3x+4}{2}$

Solve for y

$10x + 6\left(\frac{-3x+4}{2}\right) = 14$

$10x - 9x + 12 = 14$

$x = 2$

Substitute for y in other eq'n. Solve for x

$y = \frac{-3(2)+4}{2}$

$= \frac{-6+4}{2} = -\frac{2}{2} = -1$

$y = -1$

Back-substitution.

(16) S'4.2

$6x - 2y + z = 5$

$3x + y + 3z = 7$

$x + 4y - z = 4$

$z = -6x + 2y + 5$

$z = -6 + 2 + 5$

$\boxed{z = 1}$

$3x + y + 3(-6x + 2y + 5) = 7$

$x + 4y - (-6x + 2y + 5) = 4$

$3x + y - 18x + 6y + 15 = 7$

$-15x + 7y = -8$

$x + 4y + 6x - 2y - 5 = 4$

$7x + 2y = 9$

$\boxed{\begin{array}{l} -15x + 7y = -8 \\ 7x + 2y = 9 \end{array}}$

$7y = 15x - 8$

$y = \frac{15x - 8}{7}$

$(7)\left(7x + 2\left(\frac{15x - 8}{7}\right) = 9\right)$

$49x + \frac{7}{1} \cdot \frac{2(15x - 8)}{7} = 63$

$49x + 2(15x - 8) = 63$

$49x + 30x - 16 = 63$

$79x = 79$

$\boxed{x = 1}$

$\boxed{y = 1}$

$$\begin{aligned} 6x - 2y + z &= 5 \\ 3x + y + 3z &= 7 \\ x + 4y - z &= 4 \end{aligned}$$

$$\begin{aligned} x + 4y - z &= 4 \quad E1 \\ 6x - 2y + z &= 5 \quad E2 \\ 3x + y + 3z &= 7 \quad E3 \end{aligned}$$

$-6\,E1 \quad -6x - 24y + 6z = -24$

$\quad E2 \quad 6x - 2y + z = 5$

$$-26y + 7z = -19$$

-6

$-3\,E1 \quad -3x - 12y + 3z = -12$

$\quad E3 \quad 3x + y + 3z = 7$

$$-11y + 6z = -5$$

-3

New System:

$11(-26y + 7z = -19)$

$-26(-11y + 6z = -5)$

Taylon

$11E1: \quad -286y + 77z = -209$

$286y - 156z = 130$

$-79z = -79$

$z = \frac{-79}{-79} = 1$

$-11y + 6(1) = -5$

$-11y = -11$

$y = 1$

$x + 4y - z = 4$

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

$x + 3 = 4$

$x = 1$

§4.3 Mixture Probs

How many ounces of 30% HCl & 80% HCl to get 10 ounces of 50% HCl

Let x = amt of 30% HCl (oz)
y = " " 80% " (oz)

Then $x + y = 10$ → $y = 10 - x$

Amt of Pure Acid = Amt of Pure Acid

$.3x + .8y = .5(10) = 5$

$3x + 8y = 50$

$3x + 8(10 - x) = 50$

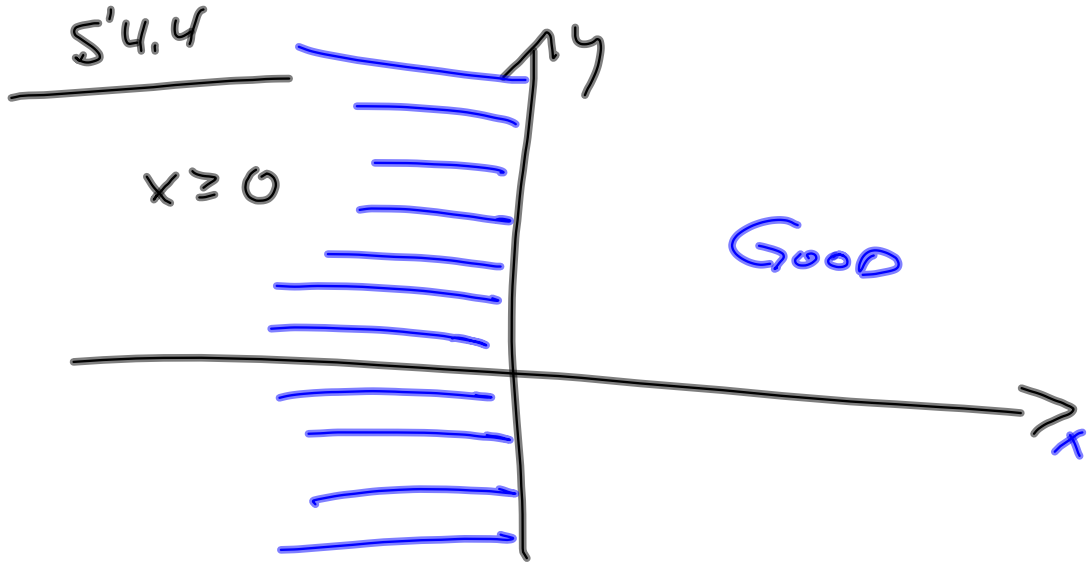
$3x + 80 - 8x = 50$

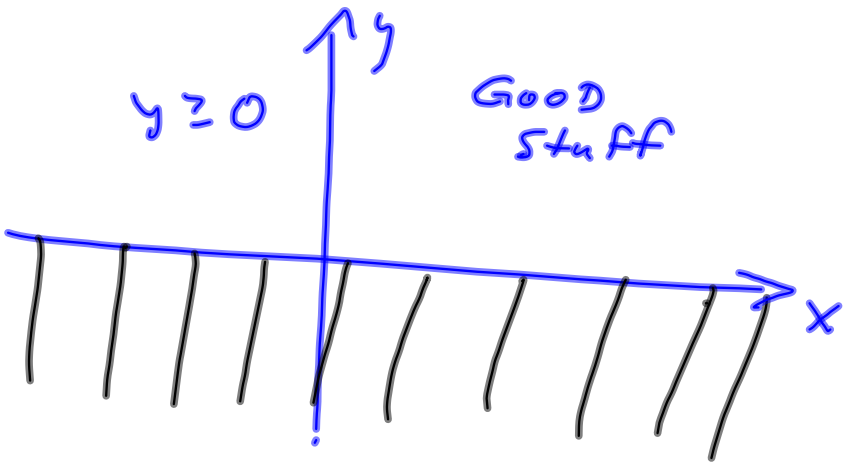
$-5x = -30$

$x = 6$

$y = 4$

xyz-textbooks


5'4.4
y
x ≥ 0
Good
x


y
y ≥ 0
Good
stuff
x

Graph the SYSTEM OF LINEAR INEQUALITIES

$2x+3y \leq 6$

$x \geq 0$

$y \geq 0$

x	y
0	2
3	0