

④ Lab Solve $x^2 + 5x - 3 = 0$

isolate terms that
contain x

$$b = \frac{5}{2}$$

$$b^2 = \left(\frac{5}{2}\right)^2 = \frac{25}{4}$$

$$x^2 + 5x + \frac{25}{4} = \frac{3}{4} + \frac{25}{4}$$

$$\left(x + \frac{5}{2}\right)^2 = \frac{12 + 25}{4}$$
$$\sqrt{\left(x + \frac{5}{2}\right)^2} = \pm \sqrt{\frac{37}{4}}$$

$$x + \frac{5}{2} = \pm \frac{\sqrt{37}}{2}$$

$$\frac{-5}{2} \quad \frac{-5}{2}$$

$$x = \frac{-5 \pm \sqrt{37}}{2}$$

$$x = \frac{-5 \pm \sqrt{37}}{2}$$

⑤
Lab

$$6x^2 + 7x = 20$$
$$\underline{\quad -20 \quad -20}$$

$$a = 6$$

$$b = 7$$

$$c = -20$$

$$6x^2 + 7x - 20 = 0$$

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

$$\frac{24}{20}$$
$$\frac{480}{480}$$

$$x = \frac{-7 \pm \sqrt{49 - 4(6)(-20)}}{12}$$

$$= \frac{-7 \pm \sqrt{49 + 480}}{12}$$

$$= \frac{-7 \pm \sqrt{529}}{12}$$

$$x = \frac{-7 \pm 23}{12}$$

$$x = \frac{-7 + 23}{12}$$

$$= \frac{16}{12}$$

$$x = \frac{4}{3}$$

$$x = \frac{-7 - 23}{12}$$

$$= \frac{-30}{12}$$

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

$$6x^2 + 7x - 20 = 0$$

prod -120
sum -7

$$6x^2 + 15x - 8x - 20 = 0$$

-8(+15)

$$3x(2x+5) - 4(2x+5) = 0$$

$$(2x+5)(3x-4) = 0$$

$$\begin{array}{r} 2x + 5 = 0 \\ \underline{-5 \quad -5} \end{array}$$

$$2x = -5$$

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

or

$$\begin{array}{r} 3x - 4 = 0 \\ \underline{+4 \quad +4} \end{array}$$

$$3x = +4$$

$$x = \frac{+4}{3}$$

48
RS.

Solve by Elimination

$$\begin{aligned} 2(5x - 3y &= 2) \\ -10x + 6y &= -4 \end{aligned} \rightarrow$$

$$\begin{array}{r} 10x - 6y = 4 \\ -10x + 6y = -4 \\ \hline 0 = 0 \end{array}$$

very true
(same line)

infinite number
of solutions

49

RS.

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

$$y = -8x + 10$$

$$5x + 2(-8x + 10) = -2$$

$$5x - 16x + 20 = -2$$

$$-11x + 20 = -2$$

$$\begin{array}{r} -20 \\ \hline \end{array}$$

$$\begin{array}{r} -20 \\ \hline -11x = -22 \\ \hline -11 \end{array}$$

$$x = 2$$

$$y = -8(2) + 10$$

$$y = -16 + 10$$

$$y = -6$$

Solution
(2, -6)

(145)

R.S.

$$(3, -2), (1, 8)$$

$$\begin{aligned} m &= \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{8 - (-2)}{1 - 3} \\ &= \frac{8 + 2}{-2} \\ &= \frac{10}{-2} \end{aligned}$$

$$m = 5$$

(46)

a) $m = 3$ and $b = 2$

y-int: $(0, 2)$

$$y = mx + b$$

$$y = 3x + 2 \text{ done}$$

b) $(3, 1)$ and $m = 2$

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

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

$$y - 1 = 2x - 6$$

$$y = 2x - 5$$

point-slope
form

4/6 b) $(2, 4)$ and $(1, 6)$

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

$$y - 6 = -2(x - 1)$$

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

$\quad \quad \quad +6$

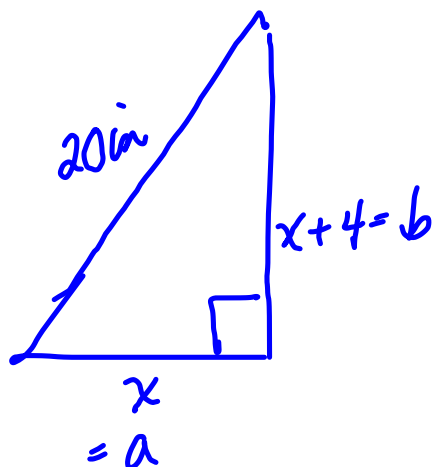
$$y = -2x + 8$$

WP
#5

20 in = hypotenuse

let x = length of one leg

$x+4$ = length of other leg



$$a^2 + b^2 = c^2 \quad \text{Pythagorean Theorem}$$

$$(x)^2 + (x+4)^2 = 20^2$$

$$x^2 + x^2 + 8x + 16 = 400$$

$$\frac{2x^2 + 8x + 16}{2} = \frac{400}{2}$$

$$\frac{x^2 + 4x + 8}{-200 \quad -200} = 200$$

$$x^2 + 4x - 192 = 0$$

$$(x+16)(x-12) = 0$$

$$x = -16 \text{ or } x = 12$$

$$x+4 = 16$$

The two legs are 12 inches and 16 inches.

prod -192
sum 4

2(91)
3(64)
- 12(16)

④

R.S.

8%
\$400 more at 9%
total interest = 155

let x = The amount invested at 8%
 $x+400$ = " amt invested at 9%

	amt	rate	interest
8%	x	.08	$.08x$
9%	$x+400$.09	$.09(x+400)$
total			155

$$[.08x + .09(x+400) = 155] \cdot 100$$

$$8x + 9(x+400) = 15500$$

$$8x + 9x + 3600 = 15500$$

$$17x + 3600 = 15500$$

$$\begin{array}{r} 17x + 3600 = 15500 \\ -3600 \quad -3600 \\ \hline \end{array}$$

$$\frac{17x}{17} = \frac{11900}{17}$$

$$x = 700$$

$$x+400 = 1100$$

He invests \$700 at 8% and
\$1100 at 9%.

③

20% alcohol

10% alcohol

50 liters of 16% alcohol?

let x = the amount of 20%

y = the amount of 10%

	amt	conc.	pure alcohol
20%	x	.20	$.20x$
10%	y	.10	$.10y$
total	50	.16	$.16(50)$

$$\begin{array}{r}
 x + y = 50 \\
 -x \quad -x \\
 \hline
 y = 50 - x
 \end{array}
 \quad
 \begin{array}{l}
 100 \left(.20x + .10y = .16(50) \right) \\
 20x + 10y = 16(50) \\
 20x + 10(50 - x) = 800 \\
 20x + 500 - 10x = 800 \\
 10x + 500 = 800 \\
 \underline{-500 \quad -500} \\
 10x = 300 \\
 x = 30 \\
 y = 20
 \end{array}$$

We must use
30 liters of 20%
alcohol and 20 liters of 10%
alcohol

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$$3x + 5y = 10$$

$$3(4) + 5y = 10$$

$$\begin{array}{r} 12 + 5y = 10 \\ -12 \quad \quad -12 \\ \hline 5y = -12 \\ \frac{5y}{5} = \frac{-12}{5} \end{array}$$

$$3(0) + 5y = 10$$

$$\frac{5y}{5} = \frac{10}{5}$$

$$y = 2$$

$$\left(4, \frac{-12}{5}\right), (0, 2), \left(\frac{-5}{3}, 3\right),$$
$$\left(\frac{10}{3}, 0\right) \quad (x, y)$$

$$3x + 5(3) = 10$$

$$3x + 15 = 10$$
$$\frac{-15}{-15} \quad \frac{-15}{-15}$$

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

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

$$3x + 5(0) = 10$$

$$\frac{3x}{3} = \frac{10}{3}$$

$$x = \frac{10}{3}$$

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$$3x - y = 6$$

let $x=0$

$$3(0) - y = 6$$
$$-y = 6$$
$$\frac{-y}{-1} = \frac{6}{-1}$$

$$y = -6$$

let $y=0$

$$3x - 0 = 6$$
$$\frac{3x}{3} = \frac{6}{3}$$

$$x = 2$$

$(0, y)$ y-int

$(x, 0)$ x-int.

$(0, -6)$ y-int

$(2, 0)$ x-intercept