

Simultaneous Linear Models

Method 1: Substitution

$$\begin{aligned} 2x + 3y &= 6 \\ 2x - y &= -2 \end{aligned} \quad (0, 2)$$

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

$$2x + 3(2 + 2x) = 6$$

$$2x + 6 + 6x = 6$$

$$\begin{aligned} 2(0) - y &= -2 \\ -y &= -2 \\ y &= 2 \end{aligned} \quad \begin{aligned} 8x + 6 &= 6 \\ 8x &= 0 \\ x &= 0 \end{aligned}$$

Method 2: Graphing

$$2x + 3y = 6$$

$$2x - y = -2$$

$$y = 2 + 2x$$

$$3y = \frac{6 - 2x}{3}$$

$$y = \frac{(6 - 2x)}{3}$$

$$(0, 2)$$

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Method 3: Elimination

$$\begin{array}{r} 2x + 3y = 6 \\ -2x + y = +2 \\ \hline \end{array}$$

$$4y = 8$$

$$y = 2$$

$$2x - 2 = -2 \quad (0, 2)$$

$$2x = 0$$

$$x = 0$$

Method 4: PlySmlt2

$$\begin{array}{r} 2x + 3y = 6 \\ 2x - y = -2 \end{array}$$

APPS → PlySmlt2

#2

(0, 2)

A carpenter makes wooden tables and chairs. He takes 10 hours to make a table and 4 hours to make a chair. The wood costs \$120 for a table and \$40 for a chair.

a) Find a linear model for the time required to make the tables and chairs. $x \rightarrow \# \text{ tables}$ $y \rightarrow \# \text{ of chairs}$

$$\text{Time} = 10x + 4y$$

b) Find a linear model for the cost of making the tables and chairs.

$$\text{Cost} = 120x + 40y$$

The carpenter works 70 hours and spends \$760 on wood.

c) How many tables and chairs can he make?

$$10x + 4y = 70$$

$$120x + 40y = 760$$

He can make 3 tables
and 10 chairs.

$$x = 3$$

$$y = 10$$

Homework Assignment:
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