

### 3.1 Solving

Oct. 12, 2006

## Linear Equations Using Addition and Subtraction.

Linear equation: an equation  
with a variable that has  
an exponent of one (1)

ie:

$$x + 3 = 7$$

Yes!



$$x - 6 = 2$$

Yes



$$x^2 + 2 = 6$$

No!



$$x^3 + 9 = 63$$

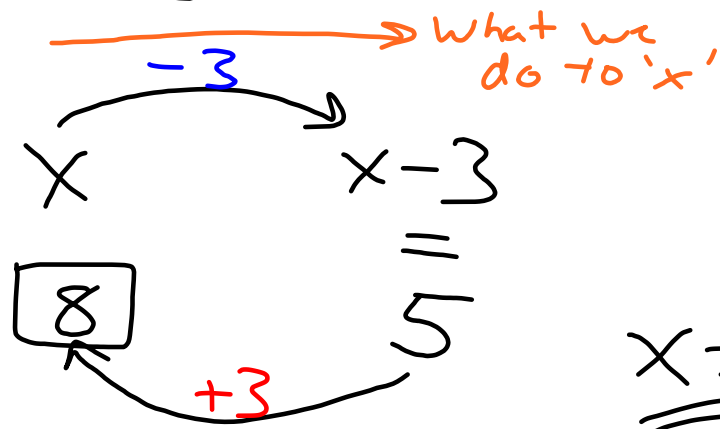
No!



# Solve Lin. Equ.

**Goal** trying to get 'x' the variable by It self

ex1)  $x - 3 = 5$



Script the Equations

$x = 8$

ex2)  $x + 6 = 2$

Diagram for solving  $x + 6 = 2$ :

Start with  $x$  on the left and  $x + 6$  on the right. A blue arrow labeled  $+6$  points from  $x$  to  $x + 6$ , with the text "what we do to 5" written below it. Below  $x + 6$  is the equation  $x + 6 = 2$ . A red arrow labeled  $-6$  points from  $2$  to a boxed  $-4$  on the left.

# Solve Lin. Equ.

vertical

ex 1a

$$\begin{array}{r} x - 3 = 5 \\ +3 \quad +3 \\ \hline x = 8 \end{array}$$

trying to get 'x'  
the variable by  
It self

$$\begin{array}{r} 8 - 3 \stackrel{?}{=} 5 \\ 5 = 5 \checkmark \end{array}$$

ex 2a

$$\begin{array}{r} x + 6 = 2 \\ -6 \quad -6 \\ \hline x = -4 \end{array}$$

$$\begin{array}{r} -4 + 6 \stackrel{?}{=} 2 \\ 2 = 2 \checkmark \end{array}$$

$$\begin{array}{r} \text{ex3} \quad x - 4 + 2 = 1 \\ \quad \quad x - 2 = 1 \\ \quad \quad + 2 \quad + 2 \\ \hline \quad \quad x = 3 \end{array}$$

ex4) Mr. G's Shortcut

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

ex5)

$$\begin{array}{r} 2x + 1 + x - 6 = 3 \\ \hline x - 5 = 3 \\ + 5 \quad + 5 \\ \hline x = 8 \end{array}$$

3.2.

# Solving Equations w/ Multiplication & Division

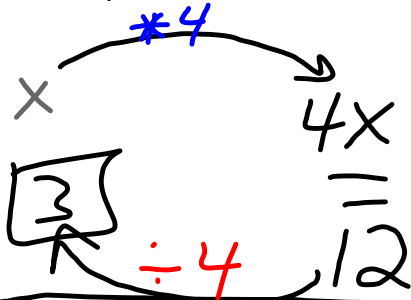
## Rotten Kid. The

What you do to one kid (side of the equ.)

You must do to the other (side of the equ.)

Solve: *script*

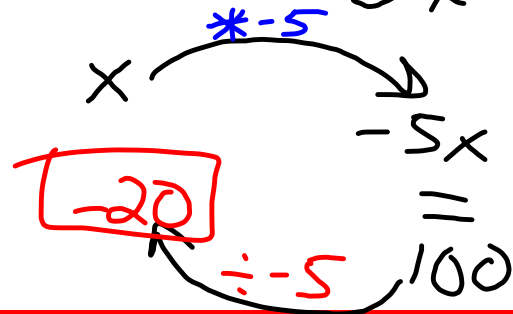
$$4x = 12$$



What are we trying to do?

Ans. get 'x'  
By itself

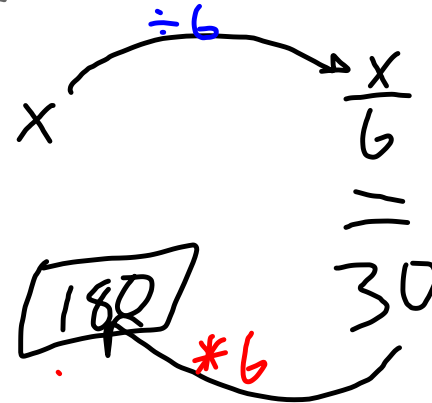
Solve:  $-5x = 100$



*script*

Solve

$$\frac{x}{6} = 30$$



Solve: <sup>vertical</sup>

$$\frac{4x}{4} = \frac{12}{4}$$

$$\underline{\underline{x = 3}}$$



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Solve:  $\frac{-5x}{-5} = \frac{100}{-5}$

$$\underline{\underline{x = -20}}$$

Solve

$$\frac{6}{1} \left( \frac{X}{6} \right) = 30 \cdot 6$$

$$\underline{\underline{x = 180}}$$

$$\frac{3 \cdot 10}{12} = \frac{3}{2} \left( \frac{2}{3} m \right)$$

$$\underline{\underline{15 = m}}$$

Side Bar

5c the opp.  
is to  $\div$  by 5

$\frac{2}{3} * m$   
the opp. of  
 $* \text{ by } \frac{2}{3}$  is  
to  $\div \frac{2}{3}$  ←

↙  
 $\div$  by a fraction  
is the same as  
 $*$  by the recip.



Solve :

$$\frac{5}{-3} \left( -\frac{3}{5} x \right) = 24.5$$

$$\underline{\underline{x = -40}}$$

O.T.L.

~~in today~~  
② Pg 135: 3-15(a); 25-39(b)

③ Pg 136: 57, 58, 59  
Use the chart above. Do 58 & 59  
and copy & fill in the chart.

O.T.L.

Pg 141-142:

17-49(o), 48