

#1  $2x^2 + 5x = 3$   
 $2x^2 + 5x - 3 = 0$   
 $(2x - 1)(x + 3) = 0$   
 $\boxed{x = \frac{1}{2} \quad | \quad x = -3}$

a and c

#5  $5 - 3x = 0$   
 is linear

#9  $2\sqrt{x} + 5 = 10$   
 is not linear

#13  $3t - 4 = 8$   
 $\frac{3t}{3} = \frac{12}{3}$   
 $\boxed{t = 4}$

#17  $4 - 3y = 2(y + 4)$   
 $4 - 3y = 2y + 8$   
 $-8 + 3y \quad +3y - 8$   
 $\frac{-4}{5} = \frac{5y}{5}$   
 $\boxed{y = -\frac{4}{5}}$

#21  $\left(\frac{1}{2}x + \frac{1}{3} = 1\right) \left(\frac{6}{6}\right)$   
 $3x + 2 = 6$   
 $\frac{3x}{3} = \frac{4}{3}$   
 $\boxed{x = \frac{4}{3}}$

#25  $\left(\frac{2x - 3}{4} + 5 = 3x\right) \left(\frac{4}{1}\right)$   
 $2x - 3 + 20 = 12x$   
 $2x + 17 = 12x$   
 $\frac{17}{10} = \frac{10x}{10}$   
 $\boxed{x = \frac{17}{10}}$

#29  $-2 \rightarrow x$

a) This stores -2 as the x value in the calculator

b) Pretty much same as [a] except 1.5 is now stored

So when  $2x^2 + x - 6$  is typed in

with enter the calculator plugs in -2 for each x.

Since  $2(-2)^2 + (-2) - 6 = 0$  then -2 is a solution or 0 for the function

#33  $-1 < 4x - 1 \leq 11$   
 $\frac{0 < 4x \leq 12}{4} \quad \frac{0 < 4x \leq 12}{4}$   
 $0 < x \leq 3$   
 $\boxed{[0, 3]}$

interval notation

#37  $2x - 1 \leq 4x + 3$   
 $\frac{-2x - 3}{-2} \leq \frac{-2x - 3}{-2}$   
 $\frac{-4}{2} \leq \frac{2x}{2}$   
 $-2 \leq x$   
 $x \geq -2$   
 $\boxed{[-2, \infty)}$

$$\textcircled{\#41} \quad 2(5-3x) + 3(2x-1) \leq 2x+1$$

$$10 - 6x + 6x - 3 \leq 2x + 1$$

$$7 \leq 2x + 1$$

$$-1 \quad \quad \quad -1$$

$$\frac{6}{2} \leq \frac{2x}{2}$$

$$3 \leq x \quad x \geq 3$$

$$\boxed{[3, \infty)}$$

$$\textcircled{\#45} \quad \left( 4 \geq \frac{2y-5}{3} \geq -2 \right) \left( \frac{3}{1} \right)$$

$$12 \geq 2y-5 \geq -6$$

$$+9 \quad \quad +9 \quad \quad +9$$

$$\frac{17}{2} \geq \frac{2y}{2} \geq \frac{-1}{2}$$

$$\frac{17}{2} \geq y \geq -\frac{1}{2}$$

$$\boxed{\left[-\frac{1}{2}, \frac{17}{2}\right]}$$

$$\textcircled{\#49} \quad \left( \frac{x-5}{4} + \frac{3-2x}{3} < -2 \right) \left( \frac{12}{1} \right)$$

$$3(x-5) + 4(3-2x) < -24$$

$$3x-15 + 12-8x < -24$$

$$-5x-3 < -24$$

$$+3 \quad \quad \quad +3$$

$$\frac{-5x}{-5} < \frac{-21}{-5}$$

$$x > \frac{21}{5}$$

$$\boxed{\left(\frac{21}{5}, \infty\right)}$$

$$\textcircled{\#53} \quad \frac{1}{2}(x-4) - 2x \leq 5(3-x)$$

$$\frac{1}{2}x - 2 - 2x \leq 15 - 5x$$

$$+2 \quad +5x \quad \quad +2 \quad +5x$$

$$3\frac{1}{2}x \leq 17$$

$$\left(\frac{2}{7}\right) \frac{7}{2}x \leq \frac{17}{1} \left(\frac{2}{7}\right)$$

$$x \leq \frac{34}{7}$$

$$\boxed{\left(-\infty, \frac{34}{7}\right]}$$

#1  $m = -2$

look at where y-int might be (10)  
and x-int? (5)  $m = \frac{10}{5} = 2$   
negative is  
down from left to right

#3  $m = \frac{y-y}{x-x}$

$\frac{9-5}{4+3} = \frac{4}{7} = m$

#5  $m = \frac{3+5}{-1+2} = \frac{8}{1} = 8$

#7  $m = \frac{9-3}{5-x} = 2$

~~(5-x)~~  $\frac{9-3}{\cancel{5-x}} = 2(5-x)$

$9-3 = 10-2x$

$6 = 10-2x$

$-10 \quad -10$

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

$2 = x$

Just set up  
the slope formula  
with the variable  
and solve

#9  $3 = \frac{y+5}{4+3}$

(7)  $3 = \frac{y+5}{7}$  (7)

$21 = y+5$   
 $-5 \quad -5$

$16 = y$

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

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

$y-4 = 2x-2$

$+4 \quad +4$

$y = 2x + 2$

#13  $y+4 = -2(x-5)$

$y+4 = -2x+10$

$-4 \quad -4$

$y = -2x + 6$

#17 Oh, I went to far!  
I just got in a groove  
and kept going. Oops, on  
to #2

#15  $(-7, -2) (1, 6)$

$m = \frac{6+2}{1+7} = \frac{8}{8} = 1$

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

~~$y-6 = x-1$~~   
 ~~$-y+6 = -x+1$~~

$y-6 = x-1$

$-y+1 = -x+1$

$-5 = x-y$

#21  $(0, 5)$   $m = -3$

$$y - 5 = -3(x - 0)$$

$$y - 5 = -3x$$

$$\begin{array}{r} +5 \qquad +5 \\ \hline y = -3x + 5 \end{array}$$

#23  $(-4, 5)$   $(4, 3)$

$$m = \frac{3 - 5}{4 - (-4)} = \frac{-2}{8} = -\frac{1}{4}$$

$$y - 3 = -\frac{1}{4}(x - 4)$$

$$y - 3 = -\frac{1}{4}x + 1$$

$$\begin{array}{r} +3 \qquad +3 \\ \hline y = -\frac{1}{4}x + 4 \end{array}$$

#25  $2x + 5y = 12$

$$\begin{array}{r} -2x \qquad -2x \\ \hline 5y = 12 - 2x \end{array}$$

$$\frac{5y}{5} = \frac{12 - 2x}{5}$$

$$y = \frac{12}{5} - \frac{2}{5}x$$

#31 (a) the slope is 1.5

look at the window dimensions under the screenshot (a) is  $[-10, 10]$  and  $[-15, 15]$  so ~~the~~ the corner point would be  $(10, 15)$ ;  $m = \frac{15}{10} = \frac{3}{2}$

#33  $y = \frac{1}{2}x + 12$   $(x, 14)$   $(18, y)$

$$\begin{array}{r} 14 = \frac{1}{2}x + 12 \\ -12 \quad -12 \\ \hline 2 = \frac{1}{2}x \end{array}$$

$$\boxed{4 = x}$$

$$y = \frac{1}{2}(18) + 12$$

$$y = 9 + 12$$

$$\boxed{y = 21}$$

#35  $3x + 4y = 26$

$$\begin{array}{r} 3x + 4(14) = 26 \\ 3x + 56 = 26 \\ -56 \quad -56 \\ \hline 3x = -30 \\ \frac{3x}{3} = \frac{-30}{3} \end{array}$$

$$\boxed{x = -10}$$

$$\begin{array}{r} 3(18) + 4(y) = 26 \\ 54 + 4y = 26 \\ -54 \quad -54 \\ \hline 4y = -28 \\ \frac{4y}{4} = \frac{-28}{4} \end{array}$$

$$\boxed{y = -7}$$

#37  $y = 3x$   $\boxed{[-30, 30]}$   $y\text{ scl} = 3$

10 tick marks in the y  
the slope is  $\frac{3}{1}$  so the slope goes up 3 units for each tick mark.

#39  $y = \frac{2}{3}x$   $\boxed{[-\frac{20}{3}, \frac{20}{3}]}$   $y\text{ scl} = \frac{2}{3}$

#41)  $(1, 2) \quad y = 3x - 2$

a)  $y - 2 = 3(x - 1)$   
 $y - 2 = 3x - 3$   
 $\begin{array}{r} y - 2 = 3x - 3 \\ + 2 \qquad + 2 \\ \hline y = 3x - 1 \end{array}$

b)  $y - 2 = -\frac{1}{3}(x - 1)$   
 $y - 2 = -\frac{1}{3}x + \frac{1}{3}$   
 $\begin{array}{r} y - 2 = -\frac{1}{3}x + \frac{1}{3} \\ + 2 \qquad + 2 \\ \hline \end{array}$

$y = -\frac{1}{3}x + 2\frac{1}{3}$  or  $y = -\frac{1}{3}x + \frac{7}{2}$

#43)  $(3, 1) \quad 2x + 3y = 12$   
 $\begin{array}{r} 2x + 3y = 12 \\ -2x \qquad -2x \\ \hline 3y = 12 - 2x \\ \frac{3y}{3} = \frac{12 - 2x}{3} \\ y = 4 - \frac{2}{3}x \end{array}$

a)  $y - 1 = -\frac{2}{3}(x - 3)$   
 $y - 1 = -\frac{2}{3}x + 2$   
 $\begin{array}{r} y - 1 = -\frac{2}{3}x + 2 \\ + 1 \qquad + 1 \\ \hline y = -\frac{2}{3}x + 3 \end{array}$

b)  $y - 1 = \frac{3}{2}(x - 3)$   
 $y - 1 = \frac{3}{2}x - \frac{9}{2}$   
 $\begin{array}{r} y - 1 = \frac{3}{2}x - \frac{9}{2} \\ + 1 \qquad + 1 \\ \hline y = \frac{3}{2}x - \frac{7}{2} \end{array}$

#51) a) use calculator!

$(1990, 3.8) \quad (1995, 5)$

$m = \frac{5 - 3.8}{1995 - 1990} = \frac{1.2}{5} = .24$

$y - 5 = .24(x - 1995)$   
 $y - 5 = .24x - 478.8$   
 $\begin{array}{r} y - 5 = .24x - 478.8 \\ + 5 \qquad + 5 \\ \hline \end{array}$

$y = .24x - 473.8$

$y = .351x - 695.776$

b) 7.64 trillion  
 $y = .24(2006) - 473.8$

or  $y = .351(2006) - 695.776$   
 8.33 trillion

c)  $y = .24(2010) - 473.8$   
 8.6 trillion

$y = .351(2010) - 695.776$   
 9.734 trillion