Straight line Solutions

A) Equation of $y = mx + c$

$m = \frac{y_2 - y_1}{x_2 - x_1}$ $(0,5)$ $(5,55)$ $= \frac{55-5}{5-0} = \frac{50}{5} = 10$ $\quad c = 5$

$y = 10x + 5$

B) $y = mx + c$ $\quad m \Rightarrow \frac{y_2 - y_1}{x_2 - x_1}$ $(-2,0)$ $(0,5)$ $= \frac{5-0}{-2-0} = \frac{5}{-2}$

$c = 5$ $\quad y = -\frac{5}{2}x + 5$

C) $y = mx + c$ $\quad m = -30$ $\quad c = 150$

$y = -30x + 150$

$V = -30t + 150$

D) $y = mx + c$ $\quad m = \frac{y_2 - y_1}{x_2 - x_1}$ $(-1,-1)$ $(1,3)$ $\Rightarrow \frac{3-(-1)}{1-(-1)} = \frac{4}{2} = 2$

$c = 1$ $\quad y = 2x + 1$

E) (a) $2y + x = 6$

$-x \quad -x$

$2y = -x + 6$

$\div 2 \quad \div 2$

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

$m = -\frac{1}{2}$ $\quad$ (b) $c = 3$

F) (a) $y = mx + c$

$m = \frac{y_2 - y_1}{x_2 - x_1}$ $(0,8)$ $(4,0)$ $= \frac{0-8}{4-0} = \frac{-8}{4}$

$= -2$

$c = 8$ $\quad y = -2x + 8$

(b) $y = 2x$

point of intersection $\Rightarrow$ simultaneous equation

$y - 2x = 0$

$y + 2x = 8$

$2y = 8$

$\div 2 \quad y = 4$

$4 - 2x = 0$

$4 = 2x$

$2 = x$

$(2,4)$ = point of intersection

This could also be shown graphically.

G) $(0,-3)$ $(-2,-11)$

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-11-(-3)}{-2-(0)} = \frac{-8}{-2} = 4$ $\quad c = -3$

$y = 4x - 3$

H) $y = 4x + 5$

$m = 4$ (gradient)

I) $x + y = 5$

$y = -x + 5$

$m = -1$

gradient $= -1$

J) AB equation $\Rightarrow y = mx + c$

$(0, 8)$ $(6, 0)$

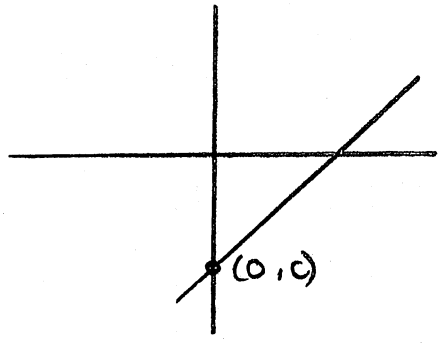
$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - 8}{6 - 0} = \frac{-8}{6} = \frac{-4}{3}$

$c = 8$ $y = \frac{-4}{3}x + 8$

K) $y = mx + c$

$m > 0 \Rightarrow$ positive gradient

$c < 0 \Rightarrow$ negative y-intercept



L) $y = mx + c$

$m = \frac{y_2 - y_1}{x_2 - x_1}$ $x_1\ y_1$ $(-3, 5)$ $x_2\ y_2$ $(7, -4)$

$\frac{-4 - 5}{7 - (-3)} = \frac{-9}{10} = m$