14) Any line perpendicular to $y = 4x + 3$ must have slope $-\frac{1}{4}$.

15) Solve the following systems of equations

a) $2x + 4y = 3$
$3x - y = 1$ $\cdot 4$

$2x + 4y = 3$
$12x - 4y = 4$
$14x = 7$
$x = \frac{1}{2}$

$2(\frac{1}{2}) + 4y = 3$
$1 + 4y = 3$
$4y = 2$
$y = \frac{1}{2}$

$(\frac{1}{2}, \frac{1}{2})$

b) $x = 4 - 2y$
$x + 2y = 6$

$x + 2y = 4$
$x + 2y = 6$ $\cdot -1$

$x + 2y = 4$
$-x - 2y = -6$
$0 = -2$

no solution

c) $2x + 3y = 1$
$4x + 6y = 2$ $\cdot(-2)$

$-4x - 6y = -2$
$4x + 6y = 2$
$0 = 0$

infinitely many solutions
They are the same line

$2x + 3y = 1$

16) The sum of two numbers is 8. The larger number minus the smaller number is 20. Find the numbers.

x = larger #
y = smaller #

$x + y = 8$
$x - y = 20$
$2x = 28$
$x = 14$

$14 + y = 8$
$y = -6$

check $x - y = 14 - (-6) = 20$ ✓

numbers are 14 and -6