Aptitude Assignment-2

1) Initial Ratio: 2:3

i.e 2+3=5, 2 parts are milk 3 parts are water

Total quantity = 40

So milk: $\frac{2}{5} \times 40 = 16$ liters

water = $\frac{3}{5} \times 40 = 24$ liters

New quantity will be $40+x$

new ratio: 4:11 i.e out of 15

4 are milk, 11 are water

$$\left(\frac{4}{15}\right) \times (40+x) = 16$$

$$4(40+x) = 240$$

$$160 + 4x = 240$$

$$x = \frac{80}{40} = 20$$

2) $2x+3y = 0$

When $x=0$

$2\times0+3y=0 \Rightarrow y=0$

When $y=0$

$2x+3\times0=0 \Rightarrow x=0$

$\therefore (0,0)$ is co-ordinate where given linear Equation meets at x & y-axis.

3) $a^2 - b^2 = 19$

$(a+b)(a-b) = 19$

Since 19 is prime number, its only positive integer factors are 1 & 19

$a+b = 19$

$a-b = 1$

Solving the eqn

$2a = 20 \rightarrow \boxed{a = 10}$

$\boxed{b = 9}$

4) find $a^3 + b^3 + c^3 + 3abc$

$a^3+b^3+c^3 + c^3 + 3abc = (a+b+c)(a^2+b^2+c^2-ab-ac-bc)$

$a^3+b^3+c^3 + 3abc = S(10-ab-bc-ac)$

we have

$a+b+c = S$

$(a+b+c)^2 = S^2$

$a^2+b^2+c^2 + 2ab+2ac+2bc = 2S$

$10 + 2ab + 2ac + 2bc = 2S$

$ab+bc+ac = \frac{15}{2}$

$a^3 + b^3 + c^3 + 3abc = S(10 - (ab+bc+ac))$

$= S(10 - \frac{15}{2})$

$= S(\frac{5}{2})$

$= \frac{25}{2}$

5) Not able to solve.