2) $ax^2 + bx - a = 0$

$\alpha + \beta = \frac{-b}{a}$

$\alpha\beta = \frac{-a}{a} = -1$

যুলসমূহের যোগফল,

$a\alpha + b + a\beta + b$

$= a(\alpha + \beta) + 2b$

$= -b + 2b$

$= b$

যুলসমূহের গুণফল,

$(a\alpha + b)(a\beta + b)$

$= a^2\alpha\beta + ab\alpha + ab\beta + b^2$

$= -a^2 + ab(\alpha + \beta) + b^2$

$= -a^2 - b^2 + b^2$

$= -a^2$

∴ নির্ণেয় সমীকরণ, $x^2 - bx - a^2 = 0$

3) $x^2 - 2bx + b^2 - a^2 = 0$

$\alpha + \beta = 2b$

$\alpha\beta = b^2 - a^2$

$\alpha - \beta = \sqrt{(\alpha+\beta)^2 - 4(b^2 - a^2)}$

$= \sqrt{4b^2 - 4b^2 + 4a^2}$

$= 2a$

বিকল্পভাবে,
যুলসমূহের যোগফল

$\alpha + \beta + \alpha - \beta$

$= 2b + 2a$

$= 2(a+b)$

যুলসমূহের গুণফল

$(\alpha + \beta)(\alpha - \beta)$

$= 2b \times 2a$

$= 4ab$

∴ নির্ণেয় সমীকরণ $x^2 - 2(a+b) + 4ab = 0$

$ax^2+bx+c=0$

$\alpha+\beta=\frac{-b}{a}$

$\alpha\beta=\frac{c}{a}$

মূলদ্বয়ের যোগফল,

$\frac{1}{\alpha^2}+\frac{1}{\beta^2}$

$\Rightarrow \frac{\alpha^2+\beta^2}{\alpha^2\beta^2}$

$\Rightarrow \frac{(\alpha+\beta)^2-2\alpha\beta}{(\alpha\beta)(\alpha\beta)}$

$\Rightarrow \frac{\frac{b^2}{a^2}-2\frac{c}{a}}{\frac{c^2}{a^2}}$

$\Rightarrow \frac{\frac{b^2-2ac}{a^2}}{\frac{c^2}{a^2}}$

$\Rightarrow \frac{b^2-2ac}{c^2}$

মূলদ্বয়ের গুণফল,

$\frac{1}{\alpha^2}\times\frac{1}{\beta^2}$

$\Rightarrow \frac{1}{\alpha^2\beta^2}$

$\Rightarrow \frac{a^2}{c^2}$

∴ নির্ণেয় সমীকরণ

$x^2-\left(\frac{b^2-2ac}{c^2}\right)x+\frac{a^2}{c^2}=0$

$\Rightarrow c^2x^2-(b^2-2ac)x+a^2=0$ (Ans)

Given,

$a+b+c=0$

$\therefore a+b=-c$

$\therefore b+c=-a$

$\therefore c+a=-b$

$\Rightarrow b=$

১ম দ্বঘ

$(b+c-a)x^2+(c+a-b)x+(a+b-c)$

$\Rightarrow (-2a)x^2+(-2b)x+(-2c)$

~~$\Rightarrow -2(ax^2+bx+c)$~~

$\therefore D=(-2b)^2-4(-2a)(-2c)$

$=4b^2-16ac$

$=4\{(-a+c)^2-4ac\}$

$\Rightarrow 4(a-c)^2$

$\Rightarrow \{2(a-c)\}^2$ (Ans)

6) $(a^2-b^2)x^2+2(a^2+b^2)x+(a^2-b^2)=0$

মূলদ্বয় মূলদ হলে D পূর্ণবর্গ.

$\therefore D = b^2 - 4ac$

$= \{2(a^2+b^2)\}^2 - 4(a^2-b^2)(a^2-b^2)$

$\Rightarrow \{4(a^4+2a^2b^2+b^4)\} - 4(a^4-2a^2b^2+b^4)$

$\Rightarrow 4a^4+8a^2b^2+4b^4-4a^4+8a^2b^2-4b^4$

$\Rightarrow 16a^2b^2$

$\Rightarrow (4ab)^2$ পূর্ণ বর্গসংখ্যা.

7) Given,

$b = ka + \frac{c}{k}$

$\therefore D = (ka+\frac{c}{k})^2 - 4ac$

$= (ka+\frac{c}{k})^2 - 4.ka.\frac{c}{k}$

~~$= (ka)^2 - (\frac{c}{k})^2$~~

$= (ka - \frac{c}{k})^2$ পূর্ণ.

8) Given,

$a \neq b$

$D = \{-2(a+b)\}^2 - 4 \cdot 2 \cdot (a^2+b^2)$

$= 4(a^2+2ab+b^2) - 8a^2 - 8b^2$

$\Rightarrow 4a^2+8ab+4b^2-8a^2-8b^2$

$\Rightarrow -4a^2-4b^2+8ab$

$\Rightarrow -4(a^2-2ab+b^2)$

$\Rightarrow -4(a-b)^2$

$\Rightarrow -\{2(a-b)\}^2$ পূর্ণবর্গ

But, when $a=b$

$\therefore -\{2(a-a)\}^2$

$\Rightarrow -4\times(0)^2$

$= 0$ অর্থাৎ সমান হবে

9. We know,

$D = 0$

$\Rightarrow b^2 - 4ac = 0$

$\Rightarrow \{-(k+2)\}^2 - 4(k-1).4 = 0 \Rightarrow k^2 + 4k + 4 - 16k + 16 = 0$

$\Rightarrow k^2 + 4k + 4 - 18k + 8 = 0$

$\Rightarrow k^2 - 4k + 12$

$\Rightarrow k^2 - 2.k.2 -$

$\Rightarrow k^2 - 6k + 2k$

$\Rightarrow k^2 - 12k + 20 = 0$

$\Rightarrow k^2 - 10k - 2k + 20 = 0$

$\Rightarrow k(k-10) - 2(k-10) = 0$

$\Rightarrow (k-10)(k-2) = 0$

$\therefore k = 10 \mid k = 2$

$\therefore k$ এর মান (2 or 10) (Ans)

$x^2 - 2(p-2)x + 2p - 10 = 0$

10. Given,

$\alpha - \beta = 6$

$\Rightarrow (\alpha - \beta)^2 = 6^2$

$\Rightarrow (\alpha + \beta)^2 - 4\alpha\beta = 36$

We know,

$\alpha + \beta = 2(p-2)$

$\alpha\beta = 2p - 10$

$\Rightarrow \{2(p-2)\}^2 - 4(2p-10) = 36$

$\Rightarrow 4(p^2 - 4p + 4) - 4(2p-10) = 36$

$\Rightarrow 4p^2 - 16p + 16 - 8p + 40 = 36$

$\Rightarrow 4p^2 - 24p + 20 = 0$

$\Rightarrow 4(p^2 - 6p + 5) = 0$

$\Rightarrow 4\{p^2 - 5p - p + 5\} = 0$

$\Rightarrow 4\{p(p-5) - 1(p-5)\} = 0 \Rightarrow (p-5)(p-1) = 0$

$\therefore p = 5 \mid p = 1$

$D = b^2 - 4ac$

$= \{-2(p-2)\}^2 - 4.1.(2p-10)$

$= 4(p^2 - 4p + 4) - 8p + 40$

$\Rightarrow 4p^2 - 16p + 16 - 8p + 40$

$\Rightarrow 4p^2 - 24p + 56$

$\Rightarrow 4(p^2 - 6p + 14)$

$\Rightarrow 4(p^2 - 2.p.3 + 3^2 + 5)$

$\Rightarrow 4\{(p-3)^2 + 5\}$ (Ans)

10) $x^2 - 2(p-2)x + 2p - 10 = 0$

$\alpha + \beta = -2(p-2)$

$\alpha\beta = 2p - 10$

Given,

$\alpha - \beta = 6$

$\Rightarrow (\alpha - \beta)^2 = 6^2$

$\Rightarrow (\alpha+\beta)^2 - 4\alpha\beta = 36$

$\Rightarrow \{-2(p-2)\}^2 - 4 \cdot (2p-10) = 36$

$\Rightarrow 4(p^2 - 4p + 4) - 8p + 40 = 36$

$\Rightarrow 4p^2 - 16p + 16 - 8p + 40 = 36$

$\Rightarrow 4p^2 - 24p + 56 = 36$

$\Rightarrow 4(p^2 - 6p + 5) = 0$

$\Rightarrow p^2 - 5p - p + 5 = 0$

$\Rightarrow p(p-5) - 1(p-5) = 0$

$\Rightarrow (p-5)(p-1) = 0$

$\therefore p = 5 \mid p = 1$

$p = (1, 5)$

We know,

$D = b^2 - 4ac$

$= \{-2(p-2)\}^2 - 4 \cdot 1 \cdot (2p-10)$

$= 4p^2 - 16p + 16 - 8p + 40$

$= 4p^2 - 24p + 56$

$= 4(p^2 - 6p + 14)$

$= 4(p^2 - 2 \cdot p \cdot 3 + (3)^2 + 5)$

$= 4\{(p-3)^2 + 5\}$

সংখ্যাটি [illegible] [illegible]

11) $a^2x^2 + 6abx + ac + 8b^2 = 0$

weknow,

$D = 0$

$\Rightarrow (6ab)^2 - 4 \cdot a^2 \cdot (ac + 8b^2) = 0$

$\Rightarrow 36a^2b^2 - 4a^3c - 32a^2b^2 = 0$

$\Rightarrow 4a^2b^2 - 4a^3c = 0$

$\Rightarrow 4a^2(b^2 - ac) = 0$

$\Rightarrow (b^2 - ac) = 0$

$\therefore b^2 = ac$

$ac(x+1)^2 = 4b^2x$

$\Rightarrow ac(x^2 + 2x + 1) - 4b^2x = 0$

$\Rightarrow acx^2 + 2acx + ac - 4b^2x = 0$

$\therefore D = 0$

$\Rightarrow (2ac)^2 - 4 \cdot ac \cdot (ac - 4b^2) = 0$

$\Rightarrow 4a^2c^2 - 4a^2c^2 + 16b^2 = 0$

$ac(x+1)^2 = 4b^2x$

$\Rightarrow b^2(x^2 + 2x + 1) = 4b^2x$

$\Rightarrow b^2x^2 + 2b^2x + b^2 - 4b^2x = 0$

$\Rightarrow b^2x^2 - 2b^2x + b^2 = 0$

$\therefore D$

$\Rightarrow (2b^2)^2 - 4 \cdot b^2 \cdot b^2$

$\Rightarrow 4b^4 - 4b^4$

$\Rightarrow 0$

12) $x^2 - 6x - 1 + k(2x+1) = 0$

$\Rightarrow x^2 - 6x - 1 + 2kx + k = 0$

$\Rightarrow x^2 - 6x + 2kx - 1 + k = 0$

$\Rightarrow x^2 - (6 - 2k)x - 1 + k = 0$

$\therefore D = 0$

$\Rightarrow b^2 - 4ac = 0$

$\Rightarrow (6-2k)^2 - 4 \cdot (-1+k) = 0$

$\Rightarrow 36 - 24k + 4k^2 + 4 - 4k = 0$

$\Rightarrow 40 - 28k + 4k^2 = 0$

$\Rightarrow 4(k^2 - 7k + 10) = 0$

$\Rightarrow k^2 - 5k - 2k + 10 = 0$

$\Rightarrow (k-5)(k-2) = 0$

$\therefore k = 5 \mid k = 2$

$\therefore k = (5, 2)$ হবে

D বাস্তব 3 সমান হবে

অসংখ্য হবে।