If α and β be the coefficients of x^4 and x^2 respectively in the expansion of $(x + \sqrt{(x^2 - 1)})^6 + (x - \sqrt{(x^2 - 1)})^6$, then:

(a) $\alpha + \beta = -30$

(b) $\alpha - \beta = -132$

(c) $\alpha - \beta = 60$

(d) $\alpha + \beta = 60$

Answer: (b)

Solution: $(x + \sqrt{(x^2 - 1)})^6 + (x - \sqrt{(x^2 - 1)^6}$

$= 2[{}^6C_0\, x^6 + {}^6C_2 x^4(x^2 - 1) + {}^6C_4 x^2(x^2 - 1)^2 + {}^6C_6(x^2 - 1)^3]$

$= 2[32x^6 - 48x^4 + 18x^2 - 1]$

$\Rightarrow \alpha = -96$ and $\beta = 36$

$\Rightarrow \alpha - \beta = -132$