Chapter # 10 *Trigonometric Identities*

Following short questions are selected from previous 5 years papers of different boards. Solve these at your own to perform well in annual exams.

1. Find the distance between the points $P(cosx, cosy)$ and $Q(sinx, siny)$.
2. Without using tables/calculator, find the values of $sin540°$, $sin105°$ and $cos105°$.
3. If α, β, γ are the angles of a triangle ABC, then prove that $cos(\frac{\alpha+\beta}{2}) = sin\frac{\gamma}{2}$.
4. If α, β, γ are the angles of a triangle ABC, then prove that $tan(\alpha+\beta) + tan\gamma = 0$.
5. Show that $tan(\alpha+\beta) = \frac{tan\alpha+tan\beta}{1-tan\alpha tan\beta}$.
6. Show that $cos(\alpha+\beta)cos(\alpha-\beta) = cos^2\beta - sin^2\alpha$.
7. Show that $cos(\alpha+45°) = \frac{1}{\sqrt{2}}(cos\alpha - sin\alpha)$.
8. Show that $sin(\frac{\pi}{2}+\alpha) = cos\alpha$.
9. Show that $\frac{sin3x-sinx}{cosx-cos3x} = cot2x$.
10. Prove that $tan(45°+A)tan(45°-A) = 1$.
11. Prove that $cot\alpha - tan\alpha = 2cot2\alpha$.
12. Prove that $tan(270°-\theta) = cot\theta$.
13. Prove that $\frac{cos8°-sin8°}{cos8°+sin8°} = tan37°$.
14. Prove that $cot\alpha - tan\alpha = 2cot2\alpha$.
15. Prove that $sin(180°+\alpha)sin(90°-\alpha) = sin\alpha cos\alpha$.
16. Prove that $\frac{1-cos\alpha}{sin\alpha} = tan\frac{\alpha}{2}$.
17. Prove that $\frac{cos11°+sin11°}{cos11°-sin11°} = tan(56°)$.
18. Express $sin2x + sin7x$ as a product.
19. Express $sin120°sin46°$ as sum or difference.
20. Express $cos6\theta + cos3\theta$ as a product.
21. Express the product $2cos5\theta sin3\theta$ as a sum or difference.

Best of Luck