**CLASS X**

**MATHEMATICS**

**Introduction to Trigonometry (Module 2/3)**

**Worksheet**

**1. If tan α =**$\sqrt{3}$**and tan β =** $\frac{1}{\sqrt{3}}$**, 0 < α, β < 90°, find the value of cot (α + β).
Solution:**
tan α = $\sqrt{3}$  = tan 60° …(i)
tan β = $\frac{1}{\sqrt{3}}$  = tan 30° …(ii)
Solving (i) & (ii), α = 60° and β = 30°
∴ cot (α + β) = cot (60° + 30°) = cot 90° = 0

**2. If tan (A + B) =** $\sqrt{3}$ **and tan (A – B) =** $\frac{1}{\sqrt{3}}$**; 0° < A + B ≤ 90°; A > B, find A and B.
Solution**:


**3. If θ = 45°, then what is the value of 2 sec2θ + 3 cosec2θ ?**

**Solution:**

2 sec2θ + 3 cosec2θ = 2 sec2 45° + 3 cosec2 45°
= 2($\sqrt{2}$ )2 + 3$(\sqrt{2}$ )2 = 4 + 6 = 10

**4. If sin θ – cos θ = 0, find the value of, sin4θ + cos4θ .
Solution:**

sin θ – cos θ = 0 = sin θ = cos θ
⇒ $\frac{SinƟ}{CosƟ}$ = 1 ⇒ tan θ = 1 ⇒ θ = 45°
Now, sin4θ + cos4θ
= sin4 45° + cos4 45°=( $\frac{1}{\sqrt{2}}$ )4 + ( $\frac{1}{\sqrt{2}}$ )4

=$ \frac{1}{4}$ + $\frac{ 1}{4}$ = $\frac{1}{2}$

**Evaluate each of the following:**

1. **sin 45∘ sin 30∘ + cos 45∘ cos 30∘**
2. **cos 60∘ cos 45∘ – sin 60∘ sin 45∘**
3. **sin230∘ + sin245∘ + sin260∘ + sin290∘**
4. **cos230∘ + cos2 45∘ + cos260∘ + cos290∘**
5. **cosec3 30∘ cos60∘ tan3 45∘ sin2 90∘ sec2 45∘ cot30∘**
6. **sin2 30∘ cos245∘ + 4tan2 30∘ + (1/2) sin2 90∘ − 2cos2 90∘ + (1/24) cos20**
7. **If 2sin 3x = √3, find ‘x’**
8. **3. If √2 tan 2θ = √6 and θ° < 2θ < 90°, find the value of sin θ + √3 cos θ – 2 tan2 θ.**
9. **4. If 3θ is an acute angle, solve the following equation for θ:**
 **(cosec 3θ – 2) (cot 2θ – 1) = 0**
10. **If tan (A + B) = √3** **and tan (A – B) = 1 and A, B (B < A) are acute angles, find the values of A and B.**

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