

## Trigonometry Questions PDF for RRB NTPC 2024 Exam

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**Q1.** Find value of  $\frac{\tan^2\theta(\operatorname{cosec}^2\theta - 1)}{\sec\theta - \tan\theta}$  (cpo 2019\_15 sets\_set 15 Q. 122)

(a)  $\frac{1 - \cos\theta}{\sin\theta}$

(b)  $\frac{1 + \cos\theta}{\sin\theta}$

(c)  $\frac{1 + \sin\theta}{\cos\theta}$

(d)  $\frac{1 - \sin\theta}{\cos\theta}$

**Q2.** If  $\sec\theta + \tan\theta = 3$  then  $\sin\theta + \cot\theta = ?$

(a) 1.30

(b) 1.55

(c) 1.80

(d) 1.96

**Q3.**  $2(\sin^6\theta + \cos^6\theta) - 3(\sin^4\theta + \cos^4\theta) + \cos^4\theta - \sin^4\theta - 2\cos^2\theta = ?$

(a) 1

(b) -1

(c) 2

(d) -2

**Q4.**  $(\operatorname{cosec} A - \sin A)^2 + (\sec A - \cos A)^2 - (\cot A - \tan A)^2$  is equal to:

(a) 1

(b) 2

(c) 0

(d) -1

**Q5.**  $\frac{4}{3} \tan^2 60^\circ + 3 \cos^2 30^\circ - 2 \sec^2 30^\circ - \frac{3}{4} \cot^2 60^\circ$  is equal to:

(a)  $\frac{8}{3}$

(b)  $\frac{5}{4}$

(c)  $\frac{7}{3}$

(d)  $\frac{10}{3}$

**Q6.** If  $\cos P = \frac{51}{149}$ , then what is the value of  $\cot P$ ?

(a)  $\frac{61}{140}$

(b)  $\frac{51}{140}$

(c)  $\frac{51}{141}$

(d)  $\frac{51}{142}$

**Q7.** If  $\cot 4A = \tan (A + 45^\circ)$ , then what is the value of  $A$ ?

(a)  $12^\circ$

(b)  $13^\circ$

(c)  $15^\circ$

(d)  $9^\circ$

**Q8.** What is the value of  $\frac{\sec \theta + \operatorname{cosec} \theta}{\sin \theta + \cos \theta} + \frac{\sec \theta - \operatorname{cosec} \theta}{\sin \theta - \cos \theta}$  ?

(a)  $-\sec \theta \operatorname{cosec} \theta$

(b)  $2\sec \theta \operatorname{cosec} \theta$

(c)  $\sec \theta \operatorname{cosec} \theta$

(d)  $3\sec \theta \operatorname{cosec} \theta$

**Q9.** If  $\tan 2\theta \cdot \tan 4\theta = 1$  then what will be the value of  $\tan 3\theta$ .

(a) 0

(b) 1

(c)  $\sqrt{3}$

(d)  $\frac{1}{\sqrt{3}}$

**Q10.** If  $2\cos \alpha + 15\sin^2 \alpha = 7$ ,  $0^\circ < \alpha < 90^\circ$ , then what is the value of  $\frac{5 - \cot \alpha}{2 + \tan^2 \alpha}$  ?

(a)  $\frac{304}{123}$

(b)  $\frac{123}{176}$

(c)  $\frac{176}{123}$

(d)  $\frac{123}{304}$

## Solutions:

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**S1. Ans. (c)**

**Sol.**  $\frac{\tan^2\theta \times \cot^2\theta (\sec\theta + \tan\theta)}{(\sec\theta - \tan\theta)(\sec\theta + \tan\theta)}$   
 $= \sec\theta + \tan\theta$   
 $= \frac{1}{\cos\theta} + \frac{\sin\theta}{\cos\theta} = \frac{1 + \sin\theta}{\cos\theta}$

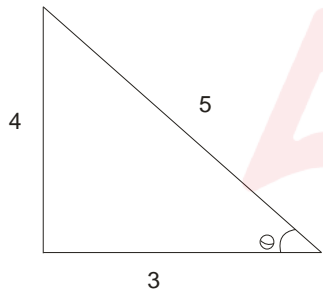
**S2. Ans. (b)**

**Sol.**  $\sec\theta + \tan\theta = 3$

$$\sec\theta - \tan\theta = \frac{1}{3}$$

$$2\sec\theta = \frac{10}{3}$$

$$\sec\theta = \frac{5}{3}$$



$$\Rightarrow \sin\theta + \cot\theta = \frac{4}{5} + \frac{3}{4}$$

$$= \frac{31}{20}$$

$$= 1.55$$

**S3. Ans. (d)**

**Sol.**  $2 - 6 \sin^2\theta \cos^2\theta - 3 + 6 \sin^2\theta \cos^2\theta + (\cos^4\theta - \sin^4\theta) - 2 \cos^2\theta$

$$-1 + \cos^2\theta - \sin^2\theta - 2 \cos^2\theta$$

$$-1 - (\sin^2\theta + \cos^2\theta)$$

$$-2$$

**S4. Ans. (a)**

**Sol.**  $\operatorname{Cosec}^2 A + \sin^2 A - 2 + \sec^2 A + \cos^2 A - 2 - \cot^2 A - \tan^2 A + 2$

$$\operatorname{Cosec}^2 A + \sec^2 A + 1 - 2 - 2 - \cot^2 A - \tan^2 A + 2$$

$$= -1 + \operatorname{cosec}^2 A + \sec^2 A - \cot^2 A - \tan^2 A$$

$$= -1 + 1 + \cot^2 A + 1 + \tan^2 A - \cot^2 A - \tan^2 A$$

$$= 1.$$

**S5. Ans. (d)**

**Sol.**  $\frac{4}{3} \times 3 + 3 \times \frac{3}{4} - 2 \times \frac{4}{3} - \frac{3}{4} \times \frac{1}{3}$

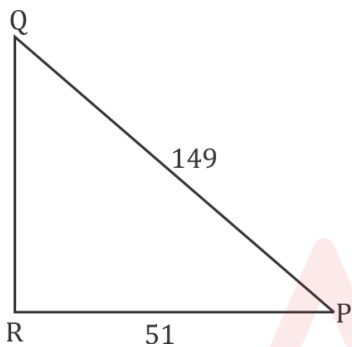
$$4 + \frac{9}{4} - \frac{8}{3} - \frac{1}{4}$$

$$= 6 - \frac{8}{3}$$

$$= \frac{10}{3}$$

**S6. Ans. (b)**

**Sol.**



$$\cos P = \frac{51}{149} = \frac{B}{H}$$

$$P = \sqrt{(149)^2 - (51)^2}$$

$$= \sqrt{200 \times 98}$$

$$= 10\sqrt{196}$$

$$= 140$$

$$\cot P = \frac{B}{P} = \frac{51}{140}$$

**S7. Ans. (d)**

**Sol.**  $\tan (90 - 4A)^\circ = \tan (A + 45^\circ)$

$$5A = 45^\circ$$

$$A = 9^\circ$$

**S8. Ans. (b)**

**Sol.**

$$\begin{aligned} & \frac{\sec \theta + \operatorname{cosec} \theta}{\sin \theta + \cos \theta} + \frac{\sec \theta - \operatorname{cosec} \theta}{\sin \theta - \cos \theta} \\ &= \frac{1}{\sin \theta \cos \theta} + \frac{1}{\sin \theta \cos \theta} = \frac{2}{\sin \theta \cos \theta} \\ &= 2 \operatorname{cosec} \theta \sec \theta \end{aligned}$$

**S9. Ans. (b)**

**Sol.**  $\tan 2\theta \tan 4\theta = 1$

If  $\tan A \tan B = 1$  then  $A + B = 90^\circ$

$$\Rightarrow 2\theta + 4\theta = 90^\circ$$

$$\Rightarrow 6\theta = 90^\circ$$

$$\Rightarrow \theta = 15^\circ$$

$$\tan 3\theta = \tan 3 \times 15 = \tan 45^\circ = 1$$

**S10. Ans(c)**

**Sol.**  $2\cos\alpha + 15\sin^2\alpha = 7$

$$2\cos\alpha + 15(1 - \cos^2\alpha) = 7$$

$$15\cos^2\alpha - 2\cos\alpha - 8 = 0$$

$$\cos\alpha = \frac{4}{5}$$

$$\sin\alpha = \frac{3}{5}$$

$$\cot\alpha = \frac{4}{3}, \tan\alpha = \frac{3}{4}$$

$$\frac{5 - \cot\alpha}{2 + \tan^2\alpha} = \frac{5 - \frac{4}{3}}{2 + \frac{9}{16}} = \frac{176}{123}$$