

$$\text{Ans: } \tan 70^\circ + \tan 50^\circ - \sqrt{3} \tan 50^\circ \tan 70^\circ$$

$$\text{Ans: } \tan(70^\circ + 50^\circ) = \tan 120^\circ = \frac{\tan 70^\circ + \tan 50^\circ}{1 - \tan 70^\circ \tan 50^\circ}$$

$$= -\sqrt{3}$$

$$\therefore \tan 70^\circ + \tan 50^\circ = -\sqrt{3} + \sqrt{3} \tan 70^\circ \tan 50^\circ$$

$$\therefore \tan 70^\circ + \tan 50^\circ - \sqrt{3} \tan 50^\circ \tan 70^\circ = -\sqrt{3}$$

$$\text{Ans: } \frac{1}{2} \tan 20^\circ + \tan 40^\circ + \sqrt{3} \tan 20^\circ \tan 40^\circ$$

$$\text{Ans: } \tan(20^\circ + 40^\circ) = \sqrt{3}$$

$$= \frac{\tan 20^\circ + \tan 40^\circ}{1 - \tan 20^\circ \tan 40^\circ}$$

$$\therefore \sqrt{3} - \sqrt{3} \tan 20^\circ \tan 40^\circ = \tan 20^\circ + \tan 40^\circ$$

$$\therefore \tan 20^\circ + \tan 40^\circ + \sqrt{3} \tan 20^\circ \tan 40^\circ = \sqrt{3}$$