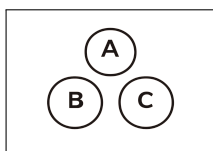


35 Formulas and Identities

Sum and Difference

C



$$\alpha = 45^\circ$$

$$\beta = 30^\circ$$

$$\theta = 75^\circ$$

$$\tan(75^\circ) = (\tan(45^\circ) + \tan(30^\circ)) / (1 - \tan(45^\circ) \tan(30^\circ))$$

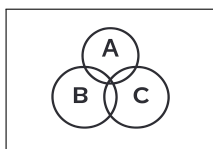
$$\tan(75^\circ) = (1 + \sqrt{3}/3) / (1 - \sqrt{3}/3)$$

$$\tan(75^\circ) = (3 + \sqrt{3}) / (3 - \sqrt{3})$$

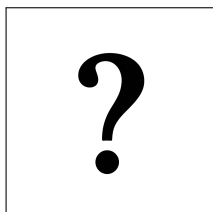
$$\tan(75^\circ) = (3 + \sqrt{3})^2 / (9 - 3)$$

$$\tan(75^\circ) = (12 + 6\sqrt{3}) / 6$$

$$\tan(75^\circ) = 2 + \sqrt{3}$$



$$\tan(\alpha \pm \beta) = (\tan(\alpha) \tan(\beta)) / (1 \mp \tan(\alpha) \tan(\beta))$$



$$\alpha = 60^\circ$$

$$\beta = 45^\circ$$

$$\theta = 105^\circ$$

$$\tan(105^\circ) = ?$$

35 Formulas and Identities

Sum and Difference

C



$$\alpha = 60^\circ$$

$$\beta = 45^\circ$$

$$\theta = 105^\circ$$

$$\tan(\alpha \pm \beta) = (\tan(\alpha) \tan(\beta)) / (1 \mp \tan(\alpha) \tan(\beta))$$

$$\tan(105^\circ) = (\tan(60^\circ) + \tan(45^\circ)) / (1 - \tan(60^\circ) \tan(45^\circ))$$

$$\tan(105^\circ) = (\sqrt{3} + 1) / (1 - \sqrt{3})$$

$$\tan(105^\circ) = ((\sqrt{3} + 1)(1 + \sqrt{3})) / ((1 - \sqrt{3})(1 + \sqrt{3}))$$

$$\tan(105^\circ) = (3 + \sqrt{3} + \sqrt{3} + 1) / (1 - 3)$$

$$\tan(105^\circ) = (4 + 2\sqrt{3}) / (-2)$$

$$\tan(105^\circ) = -2 - \sqrt{3}$$