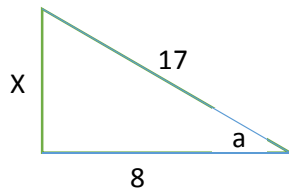


1. Jika $\cos a = \frac{8}{17}$ maka $\tan a = ?$



$$\begin{aligned} x &= \sqrt{17 \times 17 - 8 \times 8} \\ &= \sqrt{225} \\ &= 15 \end{aligned}$$

$$\tan a = \frac{15}{8}$$

2. $\sin 30^\circ \cos 60^\circ - \cos 60^\circ \sin 30^\circ = \dots$

$$\sin 30^\circ = \frac{1}{2}$$

$$\cos 60^\circ = \frac{1}{2}$$

$$\frac{1}{2} \times \frac{1}{2} - \frac{1}{2} \times \frac{1}{2}$$

$$= 0$$

3. Kuadratkan kedua ruas

$$(\sin a + \cos a)^2 = \left(\frac{1}{5}\right)^2$$

$$\sin^2 a - 2 \sin a \cos a + \cos^2 a$$

$$1 - \left(-\frac{24}{25}\right) = \frac{49}{25}$$

$$\text{Jadi, } \sin a - \cos a = \pm \sqrt{\frac{49}{25}} = \frac{7}{5}$$

4.
$$\frac{2 \tan x}{1 + \tan^2 x}$$

$$= \frac{2 \frac{\sin x}{\cos x}}{\sec^2 x}$$

$$= \frac{2 \frac{\sin x}{\cos x}}{\frac{1}{\cos^2 x}}$$

$$= 2 \sin x \cos x$$

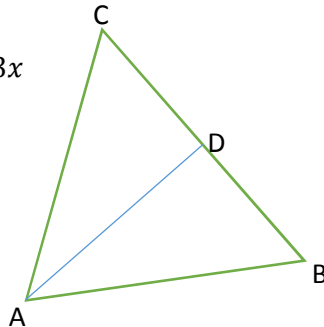
$$5. \frac{1}{2} AB \cdot AC \sin 60^\circ$$

$$\frac{1}{2} AB \cdot AD \sin 30^\circ + \frac{1}{2} AC \cdot AD \sin 30^\circ$$

$$4 \cdot 3 \frac{1}{2} \sqrt{3} = 4x \cdot \frac{1}{2} + \frac{1}{2} 3x$$

$$6\sqrt{3} = \frac{7}{2}x$$

$$x = \frac{12}{7} \sqrt{3}$$



$$6. \quad 2R_L = \frac{BC}{\sin \angle BAC}$$

$$2R_L = \frac{30}{\frac{1}{3}\sqrt{5}}$$

$$2R_L = 18\sqrt{5}$$

$$R_L = 9\sqrt{5}$$

$$7. \quad \cos(x-y) = \frac{3}{4}$$

$$\cos x \cos y + \sin x \sin y = \frac{3}{4}$$

$$\cos x \cos y + \frac{3}{10} = \frac{3}{4}$$

$$\text{Jadi, } \tan x \tan y = \frac{\sin x \sin y}{\cos x \cos y} = \frac{\frac{3}{10}}{\frac{9}{20}} = \frac{2}{3}$$

$$8. \quad \frac{\sin 81^\circ + \sin 21^\circ}{\sin 69^\circ - \sin 171^\circ} = \frac{2 \sin 51^\circ \cos 30^\circ}{-2 \cos 120^\circ \sin 51^\circ} = -\frac{\cos 30^\circ}{\cos 120^\circ} = \frac{\frac{1}{2}\sqrt{3}}{-\frac{1}{2}} = \sqrt{3}$$

$$9. \quad \sqrt{3}(1 + \cos 2x) - \sin 2x - 1\sqrt{3} = 0$$

$$\sqrt{3} \cos 2x - \sin 2x - 1 = 0$$

$$2 \cos (2x - 330^\circ) - 1$$

$$\cos (2x - 330^\circ) = \frac{1}{2}$$

$$\rightarrow 2x - 330 = 60 \cdot k \cdot 180^\circ$$

$$X = 195^\circ + k \cdot 180^\circ$$

$$K = -1 \rightarrow -15^\circ$$

$$K = 0 \rightarrow x = 195^\circ$$

$$\rightarrow 2x - 330^\circ - 300^\circ + k \cdot 360^\circ$$

$$x = 315^\circ + k \cdot 180^\circ$$

$$k = 0 \rightarrow x = 315^\circ$$

$$k = 1 \rightarrow x = 495^\circ = 135^\circ$$

$$10. -\cos x - \sqrt{3} \sin x = k \cos(x - a)$$

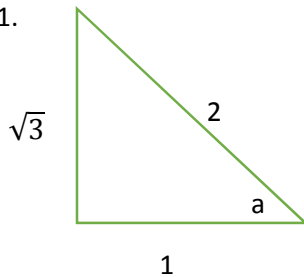
$$K = \sqrt{(-1)^2 + (-\sqrt{3})^2} = 2$$

$$\tan a = \frac{-\sqrt{3}}{-1}$$

Karena $\sin x < 0$ dan $\cos x < 0$ maka a terletak di kuadran III, yaitu 240°

$$\text{Jadi, } -\cos x - \sqrt{3} \sin x = 2 \cos\left(x - \frac{4}{3}\pi\right)$$

11.



$$\tan a = \sqrt{3}$$

$$\tan 60^\circ = \sqrt{3}$$

$$a = 60^\circ$$

$$12. \frac{\sin 30^\circ - \tan 60^\circ + \cos 60^\circ}{\tan 60^\circ - \sin 45^\circ + \cos 45^\circ}$$

$$\frac{\frac{1}{2} - \sqrt{3} + \frac{1}{2}}{\sqrt{3} - \frac{1}{2}\sqrt{2} + \frac{1}{2}\sqrt{2}}$$

$$= \frac{1 - \sqrt{3}}{\sqrt{3} - \frac{1}{2}\sqrt{2} + \frac{1}{2}\sqrt{2}}$$

$$13. \text{ Jika } \sin 35^\circ = p, \text{ maka } \cos 55^\circ =$$

$$\sin(90 - 55)$$

$$\cos 55 = p$$

$$14. \text{ Agar } \sin(3x + 48^\circ) = \cos(10^\circ - x), \text{ maka } x =$$

$$\cos(90 - (3x + 48^\circ)) = \cos(10^\circ - x)$$

$$90 - 3x - 48^\circ = 10^\circ - x$$

$$32^\circ = 2x$$

$$x = 16$$

15. Jika $\sin x = \frac{1}{2}$ dan $0^\circ < x < 360^\circ$ maka x sama dengan

$$\sin x = \frac{\sqrt{2}}{2}$$

Sin bersifat positif pada kuadran I dan II

Maka $\sin 45^\circ$ dan $\sin (180^\circ - 45^\circ)$

$\sin 45^\circ$ dan $\sin 135^\circ$

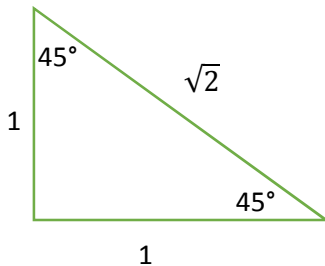
16. $\cos x = -\frac{1}{2}\sqrt{3}$

Cos yang bersifat negatif hanya pada kuadran II dan III

Maka dari itu $\cos (180^\circ - 30^\circ)$ dan $\cos (180^\circ + 30^\circ)$

Jadi, hanya $\cos 150^\circ$ dan $\cos 210^\circ$ yang bersifat negatif

17. $\tan x = \frac{1}{\tan x}$



Jadi, dari gambar ini diketahui bahwa $\tan 45^\circ$ dan $\cot 45^\circ$ itu sama karena sudut disebelah sudut x dan yang menghimpit x sama. Dari gambar ini juga dibuktikan bahwa kuadran I, II, III, IV akan menghasilkan hasil yang sama

18. $\frac{\sin^2 x + \cos^2 x}{\sin x}$

$$= \frac{1}{\sin x} = \csc x$$

19. $\frac{\tan x + \cot x}{\sec x}$

$$\frac{\frac{\sin x}{\cos x} + \frac{\cos x}{\sin x}}{\frac{1}{\cos x}}$$

$$\frac{\frac{\sin^2 x}{\sin x \cos x} + \frac{\cos^2 x}{\sin x \cos x}}{\frac{1}{\cos x}}$$

$$\frac{1}{\sin x} = \csc x$$

20. $\sin x + \cos x = 0$

Sin x ditambah cos x akan menghasilkan 0 jika salah satu bersifat positif dan negatif. Selain itu kedua angka tersebut menghasilkan angka yang sama (45°). Maka dari itu hal ini hanya dapat terjadi jika x berada di kuadran II ataupun III.

Jadi $x = 135^\circ$ ataupun 315°