

Worksheet 1

$$1) \quad \frac{1}{2}\pi = \frac{1}{2} \times 180^\circ \\ = 90^\circ$$

$$2) \quad \frac{3}{4}\pi = \frac{3}{4} \times 180^\circ \\ = 135^\circ$$

$$3) \quad \frac{5}{6}\pi = \frac{5}{6} \times 180^\circ \\ = 150^\circ$$

$$4) \quad 270^\circ \\ = 270^\circ \times \frac{\pi}{180^\circ} \\ = \frac{3}{2}\pi \text{ rad}$$

$$5) \quad 330^\circ \\ = 330^\circ \times \frac{\pi}{180^\circ} \\ = \frac{11}{6}\pi \text{ rad}$$

6) panjang AC

$$AC = \sqrt{AB^2 + BC^2} \\ AC = \sqrt{16^2 + 12^2} = \sqrt{400} = 20 \text{ cm}$$

7) $\sin \theta$

$$\sin \theta = \frac{\text{sisi depan}}{\text{sisi miring}} = \frac{BC}{AC} = \frac{12}{20} = \frac{3}{5}$$

8) $\cos \theta$

$$\cos \theta = \frac{\text{sisi samping}}{\text{sisi miring}} = \frac{AB}{AC} = \frac{16}{20} = \frac{4}{5}$$

9) $\tan \theta$

$$\tan \theta = \frac{\text{sisi depan}}{\text{sisi samping}} = \frac{BC}{AB} = \frac{12}{16} = \frac{3}{4}$$

10) $\operatorname{cosec} \theta$

$$\operatorname{cosec} \theta = \frac{1}{\sin \theta} = \frac{5}{3}$$

11) $\sec \theta$

$$\sec \theta = \frac{1}{\cos \theta} = \frac{5}{4}$$

12) $\cotan \theta$

$$\cotan \theta = \frac{1}{\tan \theta} = \frac{4}{3}$$

13) $\frac{TC}{AC} = \sin 60^\circ$

$$\frac{TC}{AC} = \frac{\sqrt{3}}{2}$$

$$\frac{12}{AC} = \frac{\sqrt{3}}{2}$$

$$AC = \frac{2 \times 12}{\sqrt{3}} = \frac{24}{\sqrt{3}} = 8\sqrt{3} \text{ cm}$$

14) $\frac{TC}{AC} = \cos 60^\circ$

$$TC = AC \cos 60^\circ = 6 \cdot \frac{1}{2} = 3 \text{ cm}$$

$$\frac{AT}{AC} = \sin 60^\circ$$

$$AT = AC \sin 60^\circ = 6 \cdot \frac{1}{2} \sqrt{3} = 3\sqrt{3} \text{ cm}$$

$$AB = 2AT = 6\sqrt{3} \text{ cm}$$

$$\text{Luas} = \frac{AB \cdot TC}{2}$$

$$\text{Luas} = \frac{6\sqrt{3} \cdot 3}{2} = 9\sqrt{3} \text{ cm}^2$$

15) $\cos 315^\circ = (360^\circ - 45^\circ)$

$$= \cos 45^\circ$$

$$= \frac{1}{2} \sqrt{2}$$

16) $r = \sqrt{x^2 + y^2}$

$$r^2 = x^2 + y^2$$

$$y^2 = r^2 - x^2$$

$$= 25 - 16$$

$$= 9$$

$$y = \sqrt{9} = \pm 3$$

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

$$y^2 = r^2 - x^2$$

$$= 625 - 576$$

$$= 49$$

$$y = \sqrt{49} = 7$$

$$\cos(\alpha - \beta) = \cos \alpha \cos \beta + \sin \alpha \sin \beta$$

$$= \frac{4}{5} \cdot \frac{24}{25} + \frac{3}{5} \cdot \frac{7}{25}$$

$$= \frac{96}{125} + \frac{21}{125} = \frac{117}{125}$$

$$17) \quad c^2 = a^2 + b^2 - 2ab \cos C$$

$$2 ab \cos C = a^2 + b^2 - c^2$$

$$\begin{aligned} \cos C &= \frac{a^2 + b^2 - c^2}{2ab} \\ &= \frac{4^2 + 5^2 - 3^2}{2 \cdot 4 \cdot 5} = \frac{38}{40} = \frac{19}{20} \end{aligned}$$

$$18) \quad \cos A = \frac{-4}{5} = \frac{x}{r}$$

$$\begin{aligned} r^2 &= x^2 + y^2 \\ y^2 &= r^2 - x^2 \\ &= 25 - 16 \\ &= 9 \end{aligned}$$

$$y = 3 \rightarrow \text{sehingga } \sin A = \frac{y}{r} = \frac{3}{5}$$

$$\begin{aligned} \sin 2A &= 2 \sin A \cos A \\ &= 2 \cdot \frac{3}{5} \cdot \frac{-4}{5} = \frac{-24}{25} \end{aligned}$$

$$19) \quad \frac{1 - 2 \cos \theta + \cos^2 \theta}{1 - \cos^2 \theta} = \frac{1}{3} \Rightarrow 1 - 2 \cos \theta + \cos^2 \theta = \frac{1}{3} (1 - \cos^2 \theta)$$

$$\begin{aligned} 1 - 2 \cos \theta + \cos^2 \theta &= \frac{1}{3} - \frac{1}{3} \cos^2 \theta \\ \frac{2}{3} - 2 \cos \theta + \frac{4}{3} \cos^2 \theta &= 0 \end{aligned}$$

$$\frac{4}{3} \cos^2 \theta - 2 \cos \theta + \frac{2}{3} = 0 \quad \times 3$$

$$\begin{aligned} 4 \cos^2 \theta - 6 \cos \theta + 2 &= 0 \\ &= \frac{6 \pm \sqrt{36 - 32}}{8} \Rightarrow x_1 = \frac{6+2}{8} = 1; x_2 = \frac{6-2}{8} = \frac{1}{2} \end{aligned}$$

$$x_1 = 1 \Rightarrow \cos \theta = 1; \theta = 0^\circ$$

$$x_2 = \frac{1}{2} \Rightarrow \cos \theta = \frac{1}{2}; \theta = 60^\circ$$

$$\theta = 0^\circ$$

$$\frac{1 - \cos \theta}{\sin \theta} = \frac{\sqrt{3}}{3} \Rightarrow \frac{1-1}{0} = -$$

$$\theta = 60^\circ$$

$$\frac{1 - \cos \theta}{\sin \theta} = \frac{\sqrt{3}}{3} \Rightarrow \frac{1 - \frac{1}{2}}{\frac{1}{2}\sqrt{3}} = \frac{\frac{1}{2}}{\frac{1}{2}\sqrt{3}} = \frac{1}{\sqrt{3}} = \frac{1}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

$$\text{Sehingga nilai } \theta = 60^\circ$$

$$\begin{aligned}
 20) \quad \frac{\sin 6x + \sin 4x}{\cos 6x + \cos 4x} &= \frac{\cancel{2} \sin \frac{1}{2}(6x+4x) \cancel{\cos \frac{1}{2}(6x-4x)}}{\cancel{2} \cos \frac{1}{2}(6x+4x) \cancel{\cos \frac{1}{2}(6x-4x)}} \\
 &= \tan \frac{1}{2} 10x = \tan 5x
 \end{aligned}$$