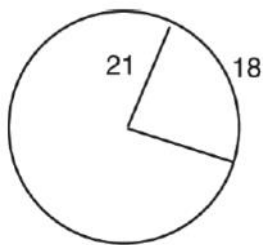


3. Find the measure, to the nearest degree, of the acute angle in the figure below.



$$\underline{2\pi r}$$

Sol:

$$C = r\theta, \quad \theta \in [0, 2\pi]$$

$$18 = 21 \cdot \theta$$

$$\frac{6}{7} \cdot \frac{18}{21} = \frac{1}{21} \theta$$

$$\text{radian } \frac{6}{7} = \theta$$

$$\theta = \frac{6}{7} \cdot \frac{180^\circ}{\pi} \approx \boxed{49^\circ}$$

$$A = \frac{1}{2} \theta r^2$$

$$\uparrow$$

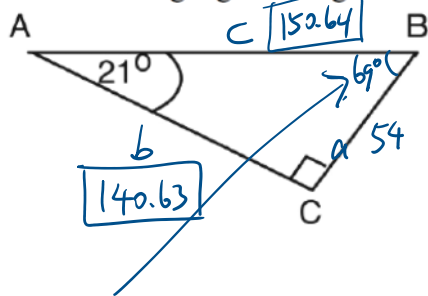
$$[0, 2\pi]$$

Area for full circle:  $A_0 = \pi r^2$

$$A_* = \pi r^2 \cdot \frac{\theta}{2\pi} \quad \left( \pi r^2 \cdot \frac{\theta}{360^\circ} \right)$$

#6, missing information

6. Solve the following right triangle:



99%

↑

Sol:  $90^\circ - 21^\circ = 69^\circ$ ,

$$a^2 + b^2 = c^2$$

Sol:  $90^\circ - 21^\circ = 69^\circ$ ,

$$\tan 21^\circ = \frac{54}{b}$$

$$\tan 21^\circ \cdot b = 1 \cdot 54$$

$$0.384 \cdot b = 54$$

$$b \approx \boxed{140.63}$$

$$a^2 + b^2 = c^2$$

$$54^2 + 140.63^2 = c^2$$

$$2916 + 19777 = c^2$$

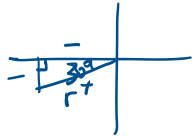
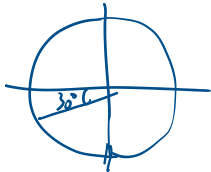
$$22693 = c^2$$

$$\pm 150.64 \approx c$$

$$\boxed{150.64} = c$$

10.  $3\sin^2 210^\circ + \tan 150^\circ$

Sol:  $\sin 210^\circ$        $210^\circ = 180^\circ + 30^\circ$



$$\sin 210^\circ = \sin 30^\circ \text{ in r.a.}$$

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

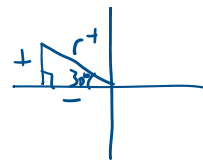
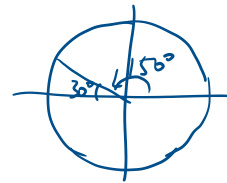
$$= 3 \cdot \left(-\frac{1}{2}\right)^2 + \left(-\frac{\sqrt{3}}{3}\right)$$

$$= 3 \cdot \frac{1}{4} - \frac{\sqrt{3}}{3}$$

$$= \frac{3}{4} - \frac{\sqrt{3}}{3} \quad \leftarrow \text{LCD: 12}$$

$$= \frac{3}{4} \cdot \frac{3}{3} - \frac{\sqrt{3}}{3} \cdot \frac{4}{4}$$

$$\tan 150^\circ$$



$$150^\circ + 30^\circ = 180^\circ$$

$$\tan 150^\circ = \tan 30^\circ \text{ in r.a.}$$

$$= -\frac{\sqrt{3}}{3}$$

$$= \frac{9}{12} - \frac{4\sqrt{3}}{12}$$

$$= \frac{9-4\sqrt{3}}{12}$$

7. 8. : "  $\sin 30^\circ = \cos 60^\circ$  "

$$\Rightarrow \sin * = \sin \# \quad \text{OR} \quad \cos * = \cos \#$$

---

"  $\tan 30^\circ = \cot 60^\circ$  "

$$\Rightarrow \tan 30^\circ = \tan 90^\circ - 60^\circ$$

$$\tan * = \tan(90^\circ - \#)$$

cos, sin, tan

8.  $\sec(18x) = \csc(6x)$

$$\frac{1}{\cos(18x)} = \frac{1}{\sin(6x)}$$

$$\sin(6x) = \cos(18x)$$

$$\sin(6x) = \sin(90^\circ - 18x)$$

$$\begin{array}{r} 6x = 90^\circ - 18x \\ +18x \qquad \qquad +18x \end{array}$$

$$\frac{24x}{24} = \frac{90^\circ}{24}$$

"  $\sin 30^\circ = \cos 60^\circ$  "

$$\begin{array}{c} \uparrow \\ \cos 60^\circ = \sin(90^\circ - 60^\circ) \end{array}$$

$$1 \frac{24x}{24} = \frac{90}{24}$$

$$x = \boxed{3.75}$$