King Fahd University of Petroleum and Minerals
Prep-Year Math Program
Math 002 - Term 062
Recitation Hour (5.1 & 5.2)

Question1

a) Convert $-345°$ to radian in measure.

Solution

$$-345° \cdot \frac{\pi}{180°} = -\frac{23\pi}{12}$$

b) Convert $\frac{3\pi}{10}$ radians to degree in measure.

Solution

$$\frac{3\pi}{10} \cdot \frac{180°}{\pi} = 54°$$

Question2

If α is the complement the angle $83°\,25'51''$ and β is the supplement of the angle $83°\,25'51''$, then find the measure of the angle $\alpha + \beta$.

Solution

$$\alpha = 90° - 83°\,25'51'' = 6°\,34'9''$$
$$\beta = 180° - 44°\,6'2'' = 135°\,53'58''$$
$$\alpha + \beta = 141°87'67'' = 142°28'7''$$

Question1

a) Find the smallest positive angle coterminal with the angle $\theta = -750°$.

Solution

$$-750° + 3(360°) = 330°$$

b) Find the exact value of $2\sin^2\frac{\pi}{3}+\tan 45°$

Solution

$$2\sin^2\frac{\pi}{3}+\tan 45°=2\cdot\frac{3}{4}+1=\frac{5}{2}$$

Question4

a) Find the length of an arc that subtends a central angle of $135°$ in a circle of diameter 40 ft.

Solution

$$\theta=135°\bullet\frac{\pi}{180°}=\frac{3\pi}{4}$$

$$S=r\theta=20\cdot\frac{3\pi}{4}=15\pi \text{ ft}$$

b) A wheel is rotating at 100 revolutions per minute .Find the angular speed of the wheel in radian per second.

Solution

$$\omega=200\cdot\frac{2\pi}{60}=\frac{20\pi}{3}$$

Question5

Find the height of a building if the angle of elevation to the top of the building changes from $30°$ to $45°$ as the observer moves a distance of 80 ft toward the building.

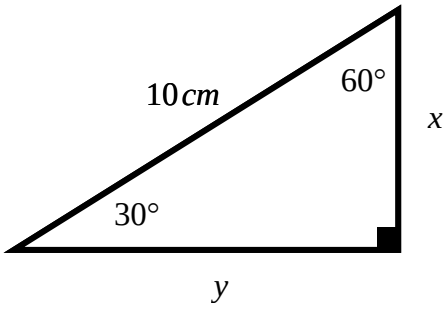
Solution

See the notes.

Question6

If the hypotenuse of a $30°, 60°$ and $90°$ triangle is 10 cm, then find the perimeter of the triangle.

Solution



$$\sin 30° = \frac{x}{10} = \frac{1}{2} \Rightarrow x = 5\,cm$$

$$\cos 30° = \frac{y}{10} = \frac{\sqrt{3}}{2} \Rightarrow x = 5\sqrt{3}\,cm$$

The perimeter is equal to $10 + 5 + 5\sqrt{3} = 15 + 5\sqrt{3}$ cm