

In this worksheet you will learn to apply trigonometric ratios to angles beyond 90°. You will practise problems involving reference angles, coterminal angles and evaluations of sine, cosine and tangent for any angle, utilising the unit circle where applicable.

Easy Questions

- 1. Find the reference angle for 150° .
- 2. Evaluate $\sin(120^\circ)$.
- 3. Evaluate $\cos(135^\circ)$.
- 4. Evaluate $\tan(210^\circ)$.
- 5. For the angle 270°, determine the values of $\sin(270^\circ)$, $\cos(270^\circ)$ and $\tan(270^\circ)$.

Intermediate Questions

- 6. Find the reference angle for 210° .
- 7. Evaluate $\sin(210^\circ)$.
- 8. Evaluate $\cos(245^\circ)$.
- 9. Determine the sign of $\tan(160^\circ)$.
- 10. Find the coterminal angle between 0° and 360° for 390° .
- 11. Write a general expression for all angles coterminal with 30° .
- 12. Find the reference angle for -120° .
- 13. Evaluate $\cos(-135^\circ)$.
- 14. Evaluate $\sin(405^\circ)$.
- 15. Determine $\tan(450^\circ)$.
- 16. Draw a unit circle and label the angle 240° on it.
- 17. For the angle 305° , determine the sign of the cosine function and find its reference angle.
- 18. Find all angles coterminal with 60° that lie between -360° and 360° .

- 19. Given that $\sin(\theta) = \frac{1}{2}$ and that θ is in the third quadrant, determine θ .
- 20. Evaluate $\cos(725^\circ)$.

Hard Questions

- 21. Explain and prove that any angle θ is coterminal with the angle $\theta + 360^{\circ}k$, where k is an integer.
- 22. Solve for an angle θ in the range $0^{\circ} < \theta < 180^{\circ}$ such that $\sin(\theta) \approx 0.866$ and θ lies in the second quadrant.
- 23. Reduce 1020° to its corresponding angle between 0° and 360° . Then, evaluate $\tan(1020^{\circ})$.
- 24. Draw a unit circle and mark the angle 135°. Label the point where the terminal side intersects the circle with its coordinates.
- 25. Given that $\cos(\theta) = -0.5$ for an angle θ lying between 180° and 270°, determine θ .
- 26. Draw a unit circle and represent the angles 30° , 150° and 210° on it. Label the corresponding points where the terminal sides meet the circle.
- 27. Explain why the sine function is periodic with period 360° using the concept of coterminal angles.
- 28. Evaluate $\sin(-450^\circ)$.
- 29. Plot the angle -225° on a unit circle and determine the coordinates of the corresponding point.
- 30. Show that 1410° is coterminal with an angle in the fourth quadrant and identify that angle.