ILLAWARRA TUTORING

This worksheet covers the sine rule and how to use it to solve non–right-angled triangles effectively. You will learn to apply the sine rule to find unknown sides or angles, recognise the ambiguous case where applicable, and ensure the triangle's validity.

Easy Questions

1. Determine side b in triangle ABC if $\angle A = 30°$, $\angle B = 45°$, and side $a = 8$.
2. In triangle PQR, given that $\angle P = 60°$, $\angle Q = 50°$, and side $p = 10$, find side q.
3. In triangle ABC, if $\angle A = 40°$, $\angle B = 80°$, and side $a = 7$, determine side b.
4. In triangle DEF, given $\angle D = 55°$, $\angle E = 65°$, and side $d = 9$, first find $\angle F$, then compute side f.
5. In triangle GHI, if side $g = 11$, side $h = 13$, and $\angle G = 40°$, use the sine rule to find $\angle H$.

Intermediate Questions

11. In triangle ABC, given $\angle A = 35°$, $\angle B = 85°$, and side $a = 12$, determine side b.
12. In triangle PQR, with side $p = 14$, side $q = 10$, and $\angle P = 50°$, find $\angle Q$.
13. In triangle XYZ, if $\angle X = 25°$, $\angle Y = 75°$, and side $x = 8$, determine side y.
14. In triangle ABC, given side $a = 9$, side $c = 12$, and $\angle A = 30°$, use the sine rule to determine $\angle C$. (Consider the possible ambiguous case.)
15. In triangle LMN, if side $l = 7$, side $m = 10$, and $\angle L = 45°$, find $\angle M$ noting the ambiguous case if relevant.
16. In triangle DEF, where $\angle D = 100°$, $\angle E = 30°$, and side $d = 15$, compute side e.
17. In triangle PQR, given side $p = 16$, side $r = 20$, and $\angle P = 40°$, determine $\angle R$.
18. In triangle ABC, if $\angle A = 70°$, $\angle C = 50°$, and side $c = 14$, find side a.
19. In triangle XYZ, given $\angle X = 55°$, $\angle Z = 65°$, and side $x = 10$, calculate side z.
20. In triangle MNO, where side $m = 8$, side $o = 11$, and $\angle M = 36°$, find $\angle O$, and state whether the solution is unique.
21. In triangle ABC, if side $a = 20$, $\angle A = 40°$, and $\angle B = 70°$, determine side b.

22. In triangle JKL, given $\angle J = 110°$, $\angle K = 30°$, and side $j = 18$, compute side k.

23. In triangle PQR, with side $p = 13$, side $q = 9$, and $\angle P = 55°$, calculate $\angle Q$.

24. In triangle ABC, given $\angle A = 40°$, $\angle B = 60°$, and side $a = 12$, determine side b.

25. In triangle DEF, if side $d = 10$, side $f = 12$, and $\angle D = 25°$, use the sine rule to find $\angle F$. Discuss the ambiguous case if applicable.

Hard Questions

21. In triangle ABC, given side $a = 8$, side $c = 10$, and $\angle A = 30°$, use the sine rule to find the possible values of $\angle C$. State both answers if they exist.

22. In triangle PQR, if side $p = 9$, side $q = 15$, and $\angle P = 40°$, find the possible measures of $\angle Q$. Discuss whether one or two triangles are possible.

23. In triangle LMN, given side $l = 7$, side $n = 9$, and $\angle L = 35°$, use the sine rule to determine $\angle N$. Discuss any ambiguous case that may arise.

24. In triangle DEF, if $\angle D = 120°$, side $d = 14$, and side $e = 10$, compute $\angle E$ using the sine rule. State if the solution is unique.

25. In triangle GHI, given side $g = 11$, side $i = 13$, and $\angle G = 47°$, find $\angle I$ using the sine rule. Consider any possible ambiguous case.

26. In triangle ABC, with $\angle A = 28°$, side $a = 16$, and side $b = 19$, determine $\angle B$. Mention if an ambiguous case arises.

27. In triangle XYZ, if side $x = 12$, side $y = 15$, and $\angle X = 33°$, find $\angle Y$ using the sine rule.

28. In triangle PQR, given $\angle P = 37°$, side $p = 21$, and side $r = 18$, calculate $\angle R$ using the sine rule. Discuss any possible multiple solutions.

29. In triangle ABC, if side $a = 14$, side $c = 17$, and $\angle A = 42°$, use the sine rule to find $\angle C$, considering both possible scenarios.

30. In triangle DEF, given $\angle D = 50°$, side $d = 17$, and side $f = 20$, first use the sine rule to find $\angle F$, then determine $\angle E$.