Year 11 Mathematics Advanced

Topic: Trigonometry and Measure of Angles (3 of 5)
Review Questions: Trigonometry of any magnitude and exact values
Term 3, 2026

How to use this review set

These are real past-paper questions, grouped by question pattern. The grey label on each question shows where it is from and its marks.

- The questions are grouped by the pattern that keeps coming up in exams, a few of each in a row, running from the plainer patterns into the harder ones near the end. Work through them and you will meet every type an exam can throw at you.
- This set **is your diagnostic**. Working through it shows you exactly which patterns are solid and which need work. Attempt every question properly in your own book, and go back to your notes to help you work through tough questions if needed.
- Every question you get wrong, need help with or struggle with goes in your **Mistakes Log**, which you should be working on daily to get you exam-ready.

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Angles of any magnitude

1. Exact values of special and any-magnitude angles

Q1 Sydney Grammar 2021 Prelim Q10 · **1 mark**

Write down the exact value of $\tan \dfrac{2\pi}{3}$.

Q2 Moriah 2021 Prelim Q3 · **1 mark**

What is the exact value of $2 \sin \dfrac{5\pi}{3}$?

(A) $\sqrt{3}$

(B) 1

(C) $-\sqrt{3}$

(D) -1

Q3 Sydney Tech 2022 Trial Q11 · **2 marks**

Write down the exact value of $\tan \dfrac{7\pi}{6}$.

Q4 Presbyterian 2022 Prelim Q2 · **1 mark**

What is the exact value of $\cos \dfrac{11\pi}{6}$?

(A) $-\dfrac{\sqrt{3}}{2}$

(B) $-\dfrac{1}{2}$

(C) $\dfrac{1}{2}$

(D) $\dfrac{\sqrt{3}}{2}$

Q5 Gosford 2024 Prelim Q3 · **1 mark**

Given that $\cos\theta = \dfrac{4}{7}$ and $\sin\theta > 0$, which of the following statements is true?

(A) $\sin\theta = \dfrac{3}{7}$

(B) $\sec\theta = \dfrac{7}{4}$

(C) $\tan\theta = \dfrac{\sqrt{33}}{4}$

(D) $\cot\theta = \dfrac{4}{\sqrt{33}}$

Q6 Killara 2022 Prelim Q5 · **1 mark**

What is the exact value of $\cos 30° + \sin 135°$?

(A) $\dfrac{\sqrt{3}-1}{2}$

(B) $\dfrac{\sqrt{3}+1}{2}$

(C) $\dfrac{\sqrt{3}-\sqrt{2}}{2}$

(D) $\dfrac{\sqrt{3}+\sqrt{2}}{2}$

Q7 Sydney Grammar 2023 Prelim Q9 · **1 mark**

Find the exact value of $\tan\dfrac{5\pi}{6}$.

2. Given one ratio and the quadrant, find another exact ratio

Q8 Abbotsleigh 2020 Trial Q12 · **2 marks**

If $\tan\theta = \dfrac{4}{5}$ and θ is acute, find the exact value of $\sin\theta$.

Q9 Pymble 2022 Prelim Q5 · **1 mark**

If $\tan\theta = \frac{2}{3}$ and θ is acute, which of the following is the exact value of $\cos\theta$?

(A) $\frac{2}{\sqrt{5}}$

(B) $\frac{3}{\sqrt{5}}$

(C) $\frac{3}{\sqrt{13}}$

(D) $\frac{2}{\sqrt{13}}$

Q10 Killara 2023 Prelim Q6 · **1 mark**

If $\cos\theta = x$ and $0° < \theta < 90°$, then $\tan\theta$ is equal to:

(A) $\frac{1}{\sqrt{1-x^2}}$

(B) $\sqrt{1-x^2}$

(C) $\frac{\sqrt{1-x^2}}{x}$

(D) $\frac{x}{\sqrt{1-x^2}}$

Q11 Fort St 2023 Trial Q22 · **2 marks**

Given that $\sin\theta = \frac{5}{13}$ and $\cos\theta < 0$, find the exact value of $\tan\theta$.

Q12 SCEGGS 2022 Prelim Q11 · **2 marks**

Given that $\tan\theta = -\frac{8}{5}$ and $90° \leq \theta \leq 180°$, find the exact value of $\sin\theta$.

Q13 Sydney Tech 2024 Trial Q11 · **2 marks**

Find the value of $\tan\theta$ if $\sin\theta = \frac{2}{\sqrt{19}}$ and θ is obtuse.

Q14 Knox 2023 Prelim Q30 · **2 marks**

Given that $\sin\theta = \frac{4}{5}$, where θ is an obtuse angle, find the exact value of $\cos\theta$.

Q15 Killara 2024 Prelim Q8 · **1 mark**

If $\cot\theta = \dfrac{24}{7}$ and $\pi < \theta \leq \dfrac{3\pi}{2}$, find the exact value of $\sin\theta$.

(A) $-\dfrac{25}{24}$

(B) $-\dfrac{7}{25}$

(C) $\dfrac{7}{25}$

(D) $\dfrac{24}{25}$

Q16 St George Girls 2023 Prelim Q13 · **3 marks**

If $\cos\theta = -\dfrac{9}{15}$ and $180° < \theta < 360°$, find the exact value of $\tan\theta$ and the possible value/s for θ to the nearest degree.

3. Simplifying with related and complementary angles

Q17 Sydney Boys 2025 Trial Q1 · **1 mark**

Which of the following is the same as $\text{cosec}(\pi + \theta)$?

(A) $\dfrac{-1}{\sin\theta}$

(B) $\dfrac{-1}{\cos\theta}$

(C) $\dfrac{1}{\cos\theta}$

(D) $\dfrac{1}{\sin\theta}$

Q18 Hurlstone 2021 Prelim Q3 · **1 mark**

When simplified, $\sin(180° + \theta) + \cos(360° - \theta)$ is equal to which of the following?

(A) $\sin\theta + \cos\theta$

(B) $\sin\theta - \cos\theta$

(C) $-\sin\theta - \cos\theta$

(D) $-\sin\theta + \cos\theta$

Q19 Loreto Kirribilli 2022 Prelim Q19 · **1 mark**

Simplify $\sin(-\theta)\cos(90° - \theta)$.

Q20 Knox 2022 Prelim Q13 · **1 mark**

Simplify $\dfrac{\sin(2\pi - \theta)}{\sin\left(\frac{\pi}{2} - \theta\right)}$.

Q21 Hornsby Girls 2021 Prelim Q10 · **2 marks**

Simplify $\tan(2\pi - x)\operatorname{cosec}(\pi - x)$.

Q22 Sydney Girls 2024 Trial Q9 · **1 mark**

Simplify $\cot(270° + x°)\cos(-x°) + \cos(90° + x°)$.

(A) $-2\sin x$

(B) $\sin x + \cos x$

(C) 0

(D) $2\sin x$