



Higher Mathematics

Trigonometric Identities - Questions

Marks are indicated in brackets after each question number

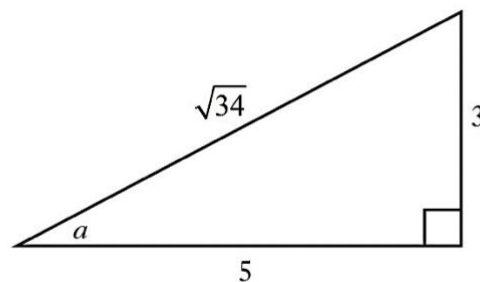
2013 Paper 1 Question 10, (2)

If $0 < a < 90$, which of the following is equivalent to $\cos(270 - a)^\circ$?

- A $\cos a^\circ$
- B $\sin a^\circ$
- C $-\cos a^\circ$
- D $-\sin a^\circ$

2014 Paper 1 Question 7, (2)

A right-angled triangle has sides and angles as shown in the diagram.



What is the value of $\sin 2a$?

2014 Paper 1 Question 18, (2)

What is the value of $1 - 2\sin^2 15^\circ$?

2015 Paper 1 Question 10, (1) (2)

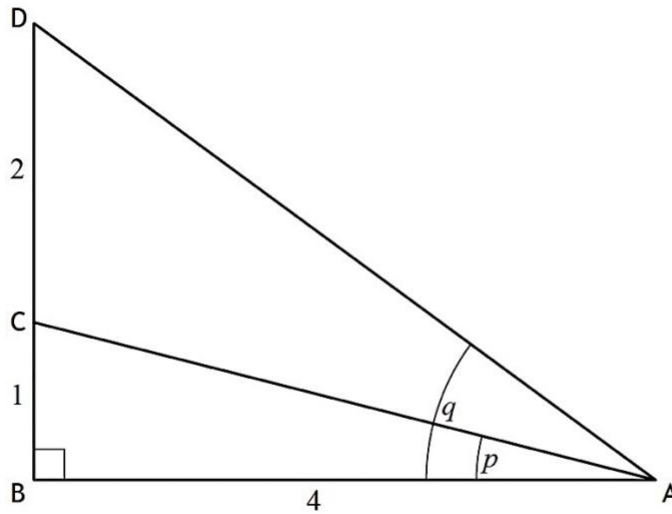
Given that $\tan 2x = \frac{3}{4}$, $0 < x < \frac{\pi}{4}$, find the exact value of

- (a) $\cos 2x$
- (b) $\cos x$.



2016 Paper 1 Question 13, (5)

Triangle ABD is right-angled at B with angles $BAC = p$ and $BAD = q$ and lengths as shown in the diagram below.



Show that the exact value of $\cos(q-p)$ is $\frac{19\sqrt{17}}{85}$.

2016 Paper 2 Question 11, (4) (2)

(a) Show that $\sin 2x \tan x = 1 - \cos 2x$, where $\frac{\pi}{2} < x < \frac{3\pi}{2}$.

(b) Given that $f(x) = \sin 2x \tan x$, find $f'(x)$.

2017 Paper 2 Question 11, (3) (3)

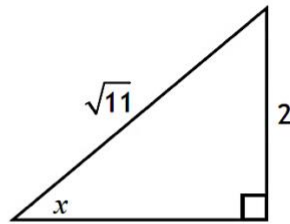
(a) Show that $\frac{\sin 2x}{2 \cos x} - \sin x \cos^2 x = \sin^3 x$, where $0 < x < \frac{\pi}{2}$.

(b) Hence, differentiate $\frac{\sin 2x}{2 \cos x} - \sin x \cos^2 x$, where $0 < x < \frac{\pi}{2}$.



2018 Paper 1 Question 13, (3) (1) (3)

The right-angled triangle in the diagram is such that $\sin x = \frac{2}{\sqrt{11}}$ and $0 < x < \frac{\pi}{4}$.



(a) Find the exact value of:

(i) $\sin 2x$

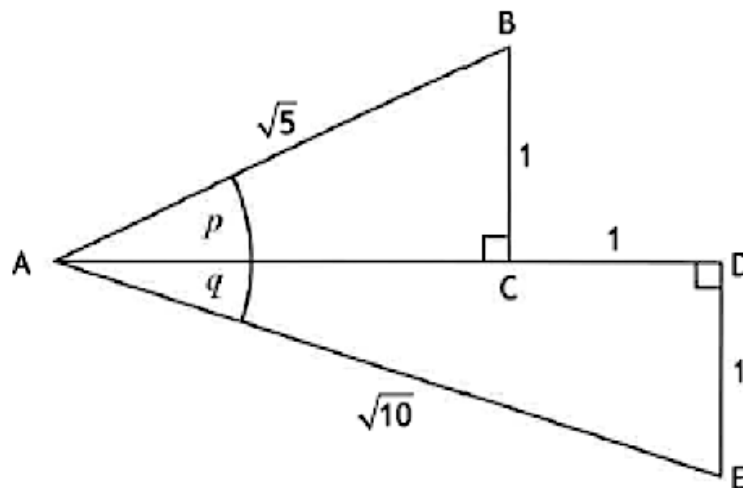
(ii) $\cos 2x$.

(b) By expressing $\sin 3x$ as $\sin(2x + x)$, find the exact value of $\sin 3x$.

2019 Paper 1 Question 13, (1) (1) (3)

Triangles ABC and ADE are both right angled.

Angles p and q are as shown in the diagram.



(a) Determine the value of

(i) $\cos p$

(ii) $\cos q$.

(b) Hence determine the value of $\sin(p + q)$.



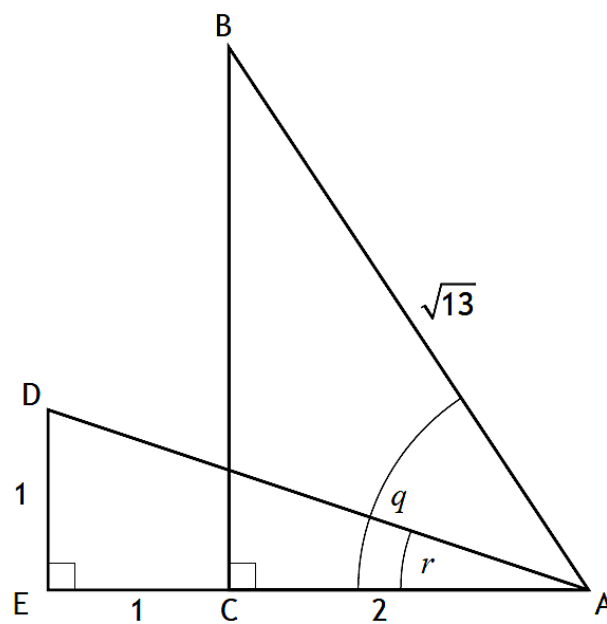
2019 Paper 1 Question 17, (3) (2)

- (a) Express $(\sin x - \cos x)^2$ in the form $p + q \sin rx$ where p , q and r are integers.
- (b) Hence, find $\int (\sin x - \cos x)^2 dx$.

2022 Paper 1 Question 7, (1) (1) (3)

Triangles ABC and ADE are both right angled.

Angle $BAC = q$ and angle $DAE = r$ as shown in the diagram.

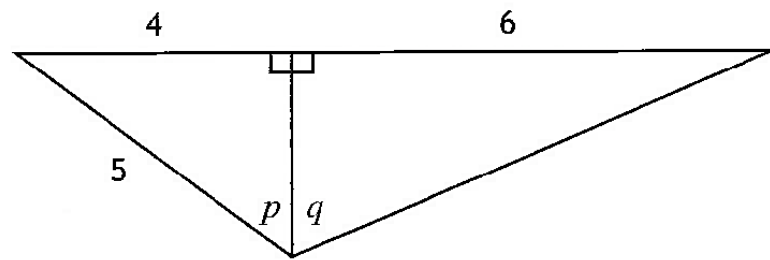


- (a) Determine the value of:
- (i) $\sin r$
 - (ii) $\sin q$.
- (b) Hence determine the value of $\sin(q - r)$.



2023 Paper 1 Question 4, (1) (1) (3)

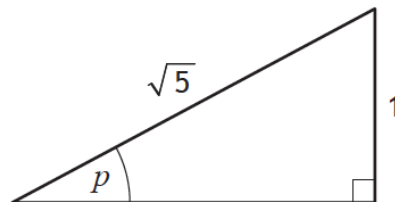
The diagram shows two right-angled triangles with angles p and q as marked.



- (a) Determine the value of:
- (i) $\cos p$
 - (ii) $\cos q$.
- (b) Hence determine the value of $\cos(p + q)$.

2024 Paper 1 Question 6, (3) (1) (1)

The right-angled triangle in the diagram is such that $\sin p = \frac{1}{\sqrt{5}}$ and $0 < p < \frac{\pi}{4}$.

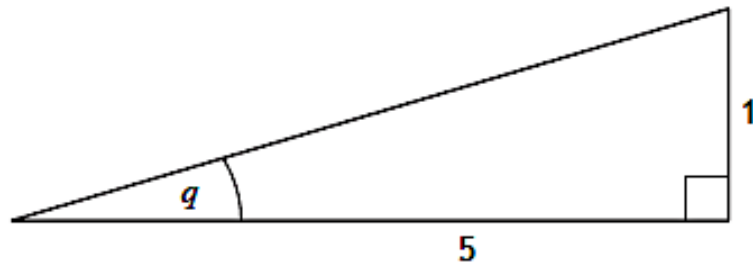


- (a) Determine the value of:
- (i) $\sin 2p$
 - (ii) $\cos 2p$.
- (b) Hence determine the value of $\sin 4p$.



2025 Paper 1 Question 6, (3) (1) (3)

The diagram shows a right-angled triangle with angle q .

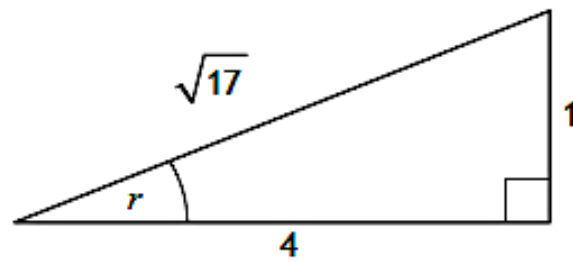


(a) Determine the value of:

(i) $\sin 2q$

(ii) $\cos 2q$.

A second right-angled triangle has angle r as shown.

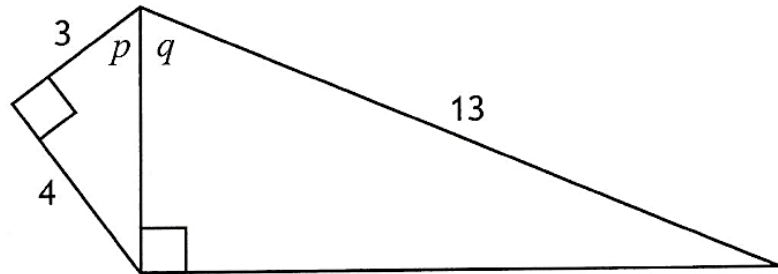


(b) Find the value of $\sin(2q - r)$.



2026 Paper 1 Question 4, (1) (4) (2) (1)

The diagram shows two right-angled triangles with angles p and q as marked.



- (a) Determine the exact value of $\sin q$.
- (b) Find the exact value of:
 - (i) $\sin(p + q)$
 - (ii) $\cos(p + q)$.
- (c) Hence find the exact value of $\tan(p + q)$.

2026 Paper 2 Question 15, (3)

Express $(3\sin\theta + \cos\theta)(\sin\theta + 3\cos\theta)$ in the form $a + b\sin c\theta$, where a , b and c are integers.