

Higher Maths - Angles and exact values - Revision

This revision pack covers the skills at Unit Assessment and exam level for Angles so you can evaluate your learning of this topic. It is important that you prepare for Unit Assessments but you should also remember that the final exam is considerably more challenging, thus practice of exam content throughout the course is essential for success. The SQA does not currently allow for the creation of practice assessments that mirror the real assessments so you should make sure your knowledge covers the sub skills listed below in order to achieve success. These angles skills are not specifically tied to any outcome but they are essential knowledge for the Higher course and can appear at any point on their own or within a trigonometry question.

Topic	Unit	Sub skills	Revision pack Questions	Heinemann Textbook
Angles and Exact Values	n/a	Introduction to Radian Measure	1, 2 and 3	Ex 4C Q1&2
		Exact values	4	Ex 4C Q3, Ex 4E
		Related angles	5	Ex 4E

When attempting a question, this key will give you additional important information.

Key	Note
◆	Question is at unit assessment level, a similar question could appear in a unit assessment or an exam.
➤	Question is at exam level, a question of similar difficulty will only appear in an exam.
#	The question includes a reasoning element and typically makes a question more challenging. Both the Unit Assessment and exam will have reasoning questions.
*	If a star is placed beside one of the above symbols that indicates the question involves sub skills from previously learned topics. If you struggle with this question you should go back and review that topic, reference to the topic will be in the marking scheme.
NC	Question should be completed without a calculator.
C	Question should be completed with a calculator.

Questions in this pack will be ordered by sub skill and typically will start off easier and then get more challenging. Some questions may also cover several sub skills from this outcome or even include sub skills from previously learned topics (denoted with a *). Questions are gathered from multiple sources including ones we have created and from past papers. **Extra challenge** questions are for extension and are not essential for either Unit Assessment or exam preparation.

FORMULAE LIST

Circle:

The equation $x^2 + y^2 + 2gx + 2fy + c = 0$ represents a circle centre $(-g, -f)$ and radius $\sqrt{g^2 + f^2 - c}$

The equation $(x-a)^2 + (y-b)^2 = r^2$ represents a circle centre (a, b) and radius r .

Scalar Product: $\mathbf{a} \cdot \mathbf{b} = |\mathbf{a}| |\mathbf{b}| \cos \theta$, where θ is the angle between \mathbf{a} and \mathbf{b}

or $\mathbf{a} \cdot \mathbf{b} = a_1 b_1 + a_2 b_2 + a_3 b_3$ where $\mathbf{a} = \begin{pmatrix} a_1 \\ a_2 \\ a_3 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} b_1 \\ b_2 \\ b_3 \end{pmatrix}$.

Trigonometric formulae:

$$\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$$

$$\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$$

$$\sin 2A = 2 \sin A \cos A$$

$$\cos 2A = \cos^2 A - \sin^2 A$$

$$= 2 \cos^2 A - 1$$

$$= 1 - 2 \sin^2 A$$

Table of standard derivatives:

$f(x)$	$f'(x)$
$\sin ax$	$a \cos ax$
$\cos ax$	$-a \sin ax$

Table of standard integrals:

$f(x)$	$\int f(x) dx$
$\sin ax$	$-\frac{1}{a} \cos ax + C$
$\cos ax$	$\frac{1}{a} \sin ax + C$

1 ◆ NC	Write the following in radians a) 45° b) 60° c) 20° d) 135°	1 1 1 1
2 ◆ NC	Write the following radian measurements in degrees a) $\frac{\pi}{4}$ b) 2π c) $\frac{2\pi}{3}$ d) $\frac{5\pi}{4}$	1 1 1 1
3 ◆ NC	Simplify a) $\frac{\pi}{3} + \frac{\pi}{2}$ b) $2\pi - \frac{2\pi}{3}$ c) $\pi - \frac{5\pi}{6}$ d) $\pi + \frac{7\pi}{6}$	1 1 1 1
4 ◆ NC	What is the exact value of a) $\sin 30^\circ$ b) $\cos \frac{\pi}{2}$ c) $\sin \frac{\pi}{3}$ d) $\tan 45^\circ$ e) $\sin \frac{\pi}{4}$	1 1 1 1 1
5 ◆ NC	What is the exact value of a) $\sin 300^\circ$ b) $\tan \frac{7\pi}{6}$ c) $\cos(-135^\circ)$ d) $\tan \frac{11\pi}{4}$	1 1 1 1

[Go to next page for the Marking Scheme]

Where suitable, you should always follow through an error as you may still gain partial credit. If you are unsure how to do this ask your teacher.

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Marking Scheme

1 ◆ NC	a)	• ¹	$\frac{\pi}{4}$
	b)	• ¹	$\frac{\pi}{3}$
	c)	• ¹	$\frac{\pi}{9}$
	d)	• ¹	$\frac{3\pi}{4}$

2 ◆ NC	a)	• ¹	45°
	b)	• ¹	360°
	c)	• ¹	240°
	d)	• ¹	225°

3 ◆ NC	a)	• ¹	$\frac{5\pi}{6}$
	b)	• ¹	$\frac{4\pi}{3}$
	c)	• ¹	$\frac{\pi}{6}$
	d)	• ¹	2π

4 ◆ NC	a)	• ¹	$\frac{1}{2}$
	b)	• ¹	0
	c)	• ¹	$\frac{\sqrt{3}}{2}$
	d)	• ¹	1
	e)	• ¹	$\frac{1}{\sqrt{2}}$

5 ◆ NC	a)	• ¹	$-\sin 60^\circ = \frac{\sqrt{3}}{2}$
	b)	• ¹	$\tan 30^\circ = \frac{1}{\sqrt{3}}$
	c)	• ¹	$-\cos 45^\circ = -\frac{1}{\sqrt{2}}$
	d)	• ¹	$-\tan 45^\circ = -1$

[END OF MARKING SCHEME]

[END OF REVISION QUESTIONS]