

2.4.5 Trig Graphs

Name: _____ Class: _____ Date: _____

KEY WORDS period

<!-- Session 2 native-skill companion -->

Objective

Practise trig graphs within the labelled native lessons. Public original tasks; locally authored answer guidance.

1 Key knowledge and worked examples

■ Exponential and degree-based trigonometric graphs · Higher

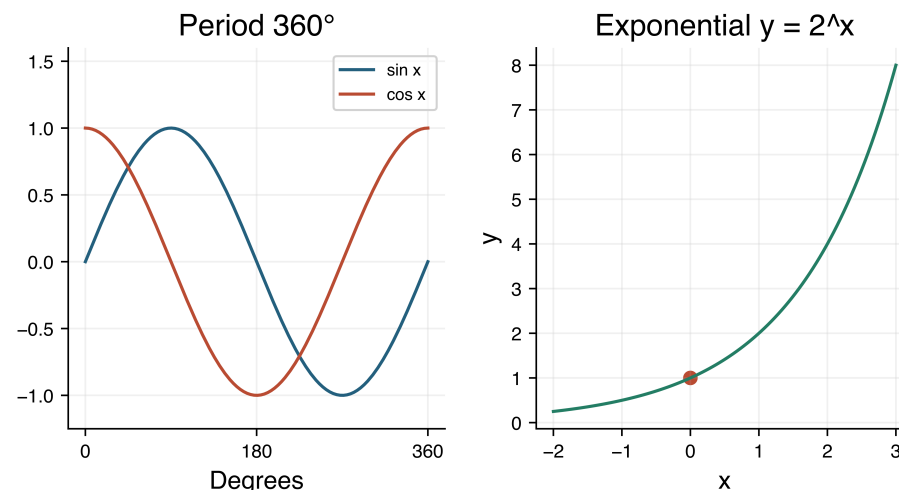
For $y=k^x$ with $k>0, k \neq 1$, the y-intercept is 1; $k>1$ gives growth and $0<k<1$ gives decay. In degrees, sine and cosine repeat every 360° with range $[-1,1]$; tangent repeats every 180° and is undefined at $90^\circ+180^\circ n$. Label axes in degrees.

$$\sin 270^\circ = -1, \quad \tan 45^\circ = 1$$

For $y=2^x$, $x=-1,0,1,3$ give $1/2,1,2,8$. Sine has values 0,1,0,-1,0 at $0^\circ,90^\circ,180^\circ,270^\circ,360^\circ$. Cosine starts at 1; $\cos 180^\circ=-1$. Tangent has $\tan 45^\circ=1$ but no finite value at 90° . For $k=1/2$, increasing x produces decay, never a negative output.

Degrees and radians are different units. A steep tangent branch is not a finite point at its asymptote. Exponential growth is not repeated addition of a constant amount.

AQA A12 Higher requires exponential functions with positive bases and sine/cosine/tangent for angles of any size in degrees. No differentiation or radian sector formula is introduced here.



Original native-lesson illustration; labels belong to its worked example.

2 Practice

2.1 (Higher) Find 2^3 .

2.2 (Higher) Find $\sin 270^\circ$.

2.3 (Higher) Find $\tan 45^\circ$.

3 Exam-style questions

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: The sine graph and tangent graph both have period 360° as their smallest positive period.

Solutions

2.1 Three factors of 2 give 8.

2.2 The unit-circle ordinate at 270° is -1.

2.3 The right triangle has equal opposite and adjacent lengths.

3.1 False. Sine has smallest positive period 360° , while tangent repeats after 180° wherever it is defined: $\tan(\theta+180^\circ)=\tan \theta$.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.