

9. Without graphing, determine the amplitude and period of each function. State the period in degrees and in radians.

a) $y = 2 \sin x$ b) $y = -4 \cos 2x$

c) $y = \frac{5}{3} \sin\left(-\frac{2}{3}x\right)$ d) $y = 3 \cos \frac{1}{2}x$

answer

9. a) Amplitude is 2; period is 360° or 2π .

b) Amplitude is 4; period is 180° or π .

c) Amplitude is $\frac{5}{3}$; period is 540° or 3π .

d) Amplitude is 3; period is 720° or 4π .

amplitudes
are identical
to the vertical
stretch but
always positive

periods a) $\sin x \rightarrow x \rightarrow 2\pi$, standard no stretch $\rightarrow 2\pi = 2(180^\circ) = 360^\circ$

b) $2x \rightarrow \frac{2\pi}{2} = \pi = 180^\circ$

c) $\frac{2}{3}x \rightarrow \frac{2\pi}{\frac{2}{3}} = 2\pi \cdot \frac{3}{2} = 3\pi = 3(180^\circ) = 540^\circ$

d) $\frac{1}{2}x \rightarrow \frac{2\pi}{\frac{1}{2}} = 2\pi \cdot \frac{2}{1} = 4\pi = 4(180^\circ) = 720^\circ$