Trigonometry - Related angles

Calculators should only be used for checking answers

Learners should have some knowledge of:

- The graphs of $y = \sin x°$, $y = \cos x°$ and $y = \tan x°$
- How angles in quadrants 2, 3 & 4 can be related to angles in quadrant 1
- Exact values for trig ratios
- Radians (extension)

Suggestions for use

- Give learners card set A
- Ask learners to group the cards in any way they see fit. It is likely they will group them by trig function, although they may decide to group them according to the size of the angles. Some might group the cards according to their value, i.e. positive or negative.
- Ask the learners to group the cards in another way.
- Ask learners which is greater: $\sin 30°$ or $\tan 60°$. How do they know?
- Ask them which is greater: $\sin 100°$ or $\tan 200°$? How do they know?
- This is an opportunity to look at the graphs of the trig functions and the four-quadrant diagram.
- Ask learners to group the cards into positive or negative values. (Any who did this previously could attempt to arrange the cards in order of size.)
- Ask learners if they know the values of any of the expressions. This is an opportunity to recap the exact values.
- Ask the learners to arrange the cards in order of size.
- Give learners card set B and C
- Ask them to arrange the cards (one each from sets A, B and C) into groups of equal value.

Extension working with radians

Give learners cards set D

- Ask them to match the cards in set D to the groups of cards created earlier.
- Or, remove cards in sets A and B and ask learners to match cards in sets C and D (more challenging).

Extension

- Give learners the “blank” cards and have the make up their own set of equivalent expressions

Card Set A

A $\sin 30°$	A $\cos 45°$
A $\tan 60°$	A $\sin 120°$
A $\cos 150°$	A $\tan 135°$
A $\sin 210°$	A $\cos 240°$
A $\sin 315°$	A $\tan 300°$

Card Set B

B $-\tan 60°$	B $-\sin 45°$
B $-\cos 60°$	B $-\sin 30°$
B $-\tan 45°$	B $-\cos 30°$
B $\sin 60°$	B $\tan 240°$
B $\cos 315°$	B $\sin 150°$

Card Set C

C 0.5	C -1
C $\frac{1}{\sqrt{2}}$	C -0.5
C $\sqrt{3}$	C $-\frac{1}{2}$
C $\frac{\sqrt{3}}{2}$	C $-\frac{1}{\sqrt{2}}$
C $-\frac{\sqrt{3}}{2}$	C $-\sqrt{3}$

Card Set D

D $\sin\frac{\pi}{6}$	D $\cos\frac{\pi}{4}$
D $\tan\frac{\pi}{3}$	D $\sin\frac{2\pi}{3}$
D $\cos\frac{5\pi}{6}$	D $\tan\frac{3\pi}{4}$
D $\sin\frac{7\pi}{6}$	D $\cos\frac{4\pi}{3}$
D $\sin\frac{7\pi}{4}$	D $\tan\frac{5\pi}{3}$