

## Activity 21 Trigonometric expressions

**Aim:** Manipulate trigonometric expressions using the ClassPad.

1. Try out the following in Main on your ClassPad and record the results.

|   |  |
|---|--|
| a) $\sin^2 x + \cos^2 x$  |  |
| b) <code>simplify(<math>\sin^2 x + \cos^2 x</math>)</code>                |  |
| c) $\sin(x + y)$  |  |
| d) $\sin(x + y) \mid x = 2y - 1$  |  |
| e) <code>expand (<math>\sin(x + y)</math>)</code>                         |  |
| f) <code>tExpand(<math>\sin(x + y)</math>)</code>                         |  |
| g) <code>simplify(ans)</code>   |  |
| h) <code>tCollect(<math>\cos x \cos y - \sin x \sin y</math>)</code>      |  |
| i) <code>tExpand(<math>\sin(x + y) + \sin(x - y)</math>)</code>           |  |
| j) <code>expand(<math>\sin 2x</math>)</code>                              |  |
| k) <code>tExpand(<math>\sin 2x</math>)</code>                             |  |
| l) <code>tExpand(<math>\sin(3x)</math>)</code>                            |  |
| m) <code>tCollect(<math>\sin^2 x</math>)</code>                           |  |
| n) <code>tExpand(<math>\sin^3 x</math>)</code>                            |  |
| o) <code>tCollect(<math>\sin^3 x</math>)</code>                           |  |
| p) <code>combine(<math>\frac{1}{\sin x} + \frac{1}{\cos x}</math>)</code> |  |
| q) <code>expand (<math>4\sin x + 4\cos x</math>)<sup>2</sup></code>       |  |
| r) <code>simplify(ans)</code>   |  |

2. Describe what the following ClassPad commands do:

a) |

b) tCollect

c) tExpand

d) combine

e) expand

f) simplify

## Learning notes

You will need to understand these commands to effectively do algebra with trigonometric expressions using CAS. Knowing which command is going to help get where you want to go is a worthwhile skill.

Hints:

- Enter powers of trig functions like  $\cos^3 x$  as  $\cos(x)^3$   
ClassPad will display as  $(\cos(x))^3$ .
- The commands `simplify`, `expand`, `tCollect` and `tExpand` can all be accessed from either the Action or Interactive menu.  
E.g. [Action | Transformation | tCollect ]