# Parametric Equations with Trigonometric Identities Codebreaker

Work out the Cartesian equation for each of the pairs below, then match to the corresponding answers and letters to find out how the sea says 'hello'.

| | | | | | | |
|---|---|---|---|---|---|---|
| $x = \sin t$<br>$y = \tan 2t$<br>$0 < t < \frac{\pi}{2}$ | $x = 3\cot t$<br>$y = \operatorname{cosec} t$<br>$0 < t < \pi$ | $x = \cos t - 2$<br>$y = \sin t + 3$<br>$0 < t < \pi$ | $x = 2\sin t - 1$<br>$y = 5\cos t + 4$<br>$0 < t < 2\pi$ | $x = \sin t - 5$<br>$y = \cos t + 2$<br>$0 < t < 2\pi$ | $x = \cos t$<br>$y = \sin 2t$<br>$0 < t < 2\pi$ | $x = \cos t + 2$<br>$y = 4\sec t$<br>$0 < t < \frac{\pi}{2}$ |
| | | | | | | |
| | | | | | | |

Answer key:

| A | D | E | F | G |
|---|---|---|---|---|
| $25(x+1)^2 + 4(y-4)^2 = 100$ | $(x+6)^2 + (y-4)^2 = 1$ | $y^2 = 4x^2(1-x^2)$ | $(x-5)^2 + (y+2)^2 = 1$ | $y = 4x^2 - 2$ |

| H | I | L | R | S |
|---|---|---|---|---|
| $y = 9x^2 - 3$ | $y = \frac{2x\sqrt{1-x^2}}{1-2x^2}$ | $y = \frac{16}{x-2}$ | $y = 1 - \left(\frac{x}{2}\right)^2$ | $y = \frac{4}{x-2}$ |

| T | U | V | W | Y |
|---|---|---|---|---|
| $y^2 = 1 + \left(\frac{x}{3}\right)^2$ | $(x+2)^2 + (y-3)^2 = 9$ | $(x+5)^2 + (y-2)^2 = 1$ | $(x+2)^2 + (y-3)^2 = 1$ | $y = \frac{\sqrt{1-x^2}}{1-2x^2}$ |