42 $y = c_1 \cos(2x) + c_2 \sin(2x)$

$y(0) = 1 \qquad y'(\pi) = 5$

$y' = -2c_1 \sin(2x) + 2c_2 \cos(2x)$

$1 = c_1 \cos(0) + c_2 \sin(0)$

$\boxed{1 = c_1}$

$5 = -2c_1 \sin(2\pi) + 2c_2 \cos(2\pi)$

$\boxed{5 = 2c_2} \qquad \boxed{c_2 = 5/2}$