6. **Figure 2**

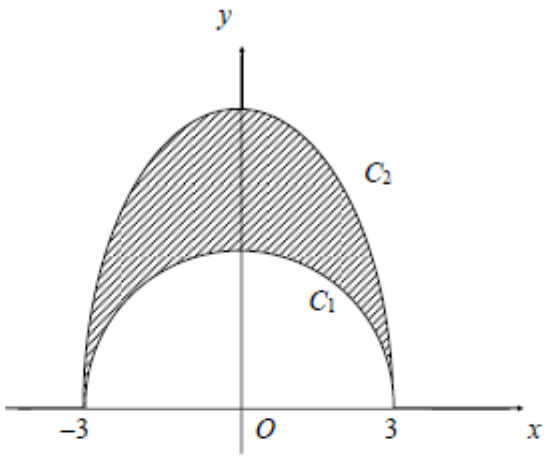

Figure 2 shows a sketch of part of two curves C_1 and C_2 for $y \geq 0$.

The equation of C_1 is $y = m_1 - x^{n_1}$ and the equation of C_2 is $y = m_2 - x^{n_2}$, where m_1, m_2, n_1 and n_2 are positive integers with $m_2 > m_1$.

Both C_1 and C_2 are symmetric about the line $x = 0$ and they both pass through the points (3, 0) and (–3, 0).

Given that $n_1 + n_2 = 12$, find

(*a*) the possible values of n_1 and n_2,

(4)

(*b*) the exact value of the smallest possible area between C_1 and C_2, simplifying your answer,

(8)

(*c*) the largest value of x for which the gradients of the two curves can be the same. Leave your answer in surd form.

(5)