# Homework Section 6.3 - Due 13th April

**There is an envelope outside my office for you to turn in this homework.**

1. #8 on page 284. Write down the solution for *all* $x$, not just in the interval $[0, 2\pi)$.
2. #20 on page 285.
3. #32 on page 285.
4. #34 on page 285.
5. (a) Verify that $2(\cos x - \sin x)(\cos x + \sin x) = 2\cos(2x)$ is an identity.
   (b) Graph $y = f(x) = 2(\cos x - \sin x)(\cos x + \sin x)$ over $[0, 2\pi)$.
   (c) On the same set of axes, sketch the line $y = 1$ and circle its intersections with $f(x)$. How many intersections are there?
   (d) Compute the values of $x \in [0, 2\pi)$ satisfying $2(\cos x - \sin x)(\cos x + \sin x) = 1$. How many solutions should you have?

*6. (a) Graph $y = \cos^2(2x) - \sin^2(2x)$ over $[0, 2\pi]$.
   (Hint: See questions 5 in homework 5.4/5.5)
   (b) Graph $-\cos(x)$ on the same set of axes. How many intersections are there?
   (c) Solve $\cos^2(2x) - \sin^2(2x) + \cos(x) = 0$ for $x \in [0, 2\pi)$. How many solutions should there be?

*7. Solve $\cos(-2x) + \sin(2x) + 2\sin^2(x) = 0$ for *all* $x$.

*Optional questions.