Quiz 7, November 17, 2016

Find the Laplace transform of $f(t) = \cos^2 2t$.

Answer. Of course, we use $\cos^2 \theta = \frac{1}{2}(1 + \cos 2\theta)$. We have

$$\mathcal{L}(f(t)) = \mathcal{L}(\tfrac{1}{2}(1 + \cos 4t)) = \tfrac{1}{2}\left(\mathcal{L}(1) + \mathcal{L}(\cos 4t)\right) = \boxed{\frac{1}{2}\left(\frac{1}{s} + \frac{s}{s^2 + 16}\right)}.$$