

MA321 Computer packages, Practice Sheet 1

1. Evaluate π and e to 50 decimal places.
2. Evaluate $\arccos(\pi/4) + \arcsin(\pi/5)$ to 25 decimal places.
3. Find the greatest common divisor and least common multiple of 1234567853 and 34524137.
4. Use MAPLE to express the number $(2+3i)^{10}(5-i)^2$ in the form $a+bi$.
5. Use MAPLE to conclude that there is a number $x \in [-1, 1]$ such that $x = \cos(x)$. (Hint: Recall the Intermediate Value Theorem.)
6. Let $\omega = \exp(2\pi i/n)$ with $i = \sqrt{-1}$. Find $(1-\omega)(1-\omega^2)\dots(1-\omega^{n-1})$ for $n = 3, 4, 5$. What do you think the general result might be for all n ? (Hint: Find out about the product command.)
7. Investigate how to use the MAPLE command “argument” to find the argument of a complex number. Hence find the argument of

$$(2+3i)^{10}(5-i)^2$$

8. Investigate how to use the MAPLE command “polar” to find the polar form of a complex number. Hence find the polar form of

$$(5+i)^8(4+3i)^{12}.$$

Check that your answer is consistent with the previous question. (Note: The command “abs”, in the case of complex numbers, returns the modulus of the given complex number.)