

Complex Analysis 2017 (Prof. M. McCall)
Multiple Choice Sheet 1

1. Determine the complex conjugates of

- (a) $5 + 3i$
- (b) $-(7 - 2i)$
- (c) i^2
- (d) $(2 - 3i)(i + 7)$

Express your answers in Cartesian coordinates and fill in the real and imaginary parts in the fields below. 1 mark each.

2. Let $z_1 = 2 + 2i$ and $z_2 = -1 + 3i$, find

- (a) z_1^{10}
- (b) z_2^{-4}
- (c) $(z_1^*)^{10}$

Express your answers in Cartesian coordinates and fill in the real and imaginary parts in the fields below. 1 mark each.

3. Which of the polynomials below have the roots $e^{i\pi/4}$, i and $e^{i3\pi/4}$ and no other roots. 3 marks.

- (a) z^8
- (b) $z^3 - i(1 + \sqrt{2})z^2 - (1 + \sqrt{2})z + i$
- (c) $z^3 - (1 + \sqrt{2})z^2 - i(1 + \sqrt{2})z + i$
- (d) $z^3 - (1 + \sqrt{2})z + 1$