**1.** **METHOD 1**

 *z* = (2 – i)(*z* + 2) M1
 = 2*z* + 4 – i*z* – 2i
*z*(1 – i) = – 4 + 2i
*z* =  A1
*z* =  M1
= – 3 – i A1

 **METHOD 2**

 let *z* = *a* *+* i*b*
 = 2 – i M1
*a* *+* i*b* = (2 *–* i)((*a* *+* 2) *+* i*b*)
*a* *+* i*b* = 2(*a* *+* 2) *+* 2*b*i *–* i(*a* *+* 2) *+* *b
a* *+* i*b* = 2*a* *+* *b* *+* 4 *+* (2*b – a –* 2)i
attempt to equate real and imaginary parts M1
*a* = 2*a* *+* *b* *+* 4( *a* *+* *b* *+* 4 = 0)
and *b* = 2*b – a –* 2( *– a* *+* *b –* 2 = 0) A1

 **Note:** Award A1 for two correct equations.

 *b* = *–*1*;a* = *–*3
*z* = – 3 – i A1

[4]

**2.** (a) │*z*│ =  and │*w*│= 
│*w*│ = 2│*z*│

attempt to solve equation M1

 **Note:** Award M0 if modulus is not used.

 *a* = *±*4 A1A1 N0

(b) *zw* = (2 – 2*a*) + (4 + *a*)i A1
forming equation 2 – 2*a* = 2 (4 + *a*) M1
*a* =  A1 N0

[6]

**3.** *a*2 + 2i*ab* *–* *b*2 = 3 + 4i
Equate real and imaginary parts (M1)
*a*2 – *b*2 = 3, 2*ab* = 4 A1
Since *b* = 
 (M1)
 *a*4 – 3*a*2 – 4 = 0 A1
Using factorisation or the quadratic formula (M1)
 *a* = ±2
 *b* = ±1
 = 2 + i, –2 – i A1A1

[7]