Date	Name	Grade / Score
		/15

1. State which of the following must be true and which one may not be true. In the following z represents complex number and $i = \sqrt{-1}$. Give reason to support your choice.

    (a) $\left| z^2 \right| = \left| z \right|^2$.

    (b) $\sqrt{z^2} = z$.

    (c) $\sqrt{z^2} = \left| z \right|$.

    (d) If b is a negative real number then $(\sqrt{-bi})^2 = b$.

    (e) If a, b, c and d are real numbers such that $a > c$ and $b > d$ then $a + bi > c + di$.

    (f) For any real numbers x and y, $\sqrt{x} \cdot \sqrt{y} = \sqrt{xy}$.

    (g) $\arg(z)$ is a real number.

    (h) z is a real number if and only if $\arg(z) = n\pi$ for some integer n.

                                                                                (8 marks)

2. Solve the following equations in z.   (7 marks)

   (a) $z^2 = \bar{z}$

   (b) $z + |\bar{z}| = 2 + i$.