MATH 365 **Name:** _____

In class work 2, Spring 2023 **Row and Seat**: _____

1. Find *both* square roots of $-1+\mathrm{i}$. Express your answer in rectangular form involving nested square roots. (AA)

2. Find the *principal square root* of $-1+\mathrm{i}$. Express your answer in rectangular form involving nested square roots. (SB)

3. Find the *principal square root* of $\mathrm{e}^{18\mathrm{i}}$. Express your answer in rectangular form involving trigonometric functions. **Hint:** You might like to use the fact that (DJ)

$$\operatorname{Arg}(z) = \arg(z) - 2\pi \left\lceil \frac{\arg(z)-\pi}{2\pi} \right\rceil .$$

4. Let $\sqrt{\ }$ be the *principal square root*. Show that $\sqrt{\overline{z}} = \overline{\sqrt{z}}$ isn't an identity. **Hint:** Try $z=-1$. (AK)

5. Let $\sqrt{\ }$ be the *principal square root*. Show that $\sqrt{z^2} = z$ isn't an identity. **Hint:** Try $z=-1$. (CR)

6. Let $\sqrt{\ }$ be the *principal square root*. Show that $\sqrt{zw} = \sqrt{z}\sqrt{w}$ isn't an identity. **Hint:** Try $z=-1$ and $w=-1$. (MS)