

Homework Questions

25, 26, 27, 28, 17, 19

$$17. (-i)^2 = i^2 = \textcircled{-1}$$

$$19. (i\sqrt{2})^2 = i^2 \cdot \sqrt{4} = \textcircled{-2}$$

$$25. \frac{1}{\sqrt{-5}} = \frac{1}{i\sqrt{5}} \cdot \frac{i\sqrt{5}}{i\sqrt{5}} = \frac{i\sqrt{5}}{i^2 \cdot 5}$$

$$\textcircled{\frac{i\sqrt{5}}{-5}}$$

$$26. \frac{4}{\sqrt{-4}} = \frac{4}{2i} \cdot \frac{i}{i} = \frac{4i}{-2} = \textcircled{-2i}$$

$$27. \frac{\sqrt{18}}{2i\sqrt{6}} = \frac{\sqrt{3}}{2i} \cdot \frac{i}{i} = \textcircled{\frac{i\sqrt{3}}{-2}}$$

$$28. \frac{\sqrt{28}}{4i\sqrt{7}} = \frac{\sqrt{4}}{4i} = \frac{2}{4i} = \frac{1}{2i} \cdot \frac{i}{i}$$

$$\textcircled{\frac{i}{-2}}$$

Homework Assessment
3/24/10

$$20. (3 + i\sqrt{5})^2$$

COMPLEX NUMBERS

Complex numbers are numbers that have both a real and an imaginary part.

Real \longrightarrow $a + bi$ \longleftarrow Imaginary

$$3 + 5i \quad -10 - 17.5i$$

Adding Complex Numbers

Add the real parts together and
add the imaginary parts together

$$\begin{array}{l} \underline{(3 + 2i)} + \underline{(5 + 7i)} \\ \hline 8 + 9i \end{array}$$

$$\begin{array}{l} (9 + 4i) + (7 - 5i) \\ \hline 16 - i \end{array}$$

$$\begin{array}{l} (-4 + 3i) - (6 - i) \\ \hline -4 + 3i - 6 + i \\ \hline -10 + 4i \end{array}$$

$$2(4 - 5i) - 3(1 - 6i)$$

$$\begin{array}{l} 8 - 10i - 3 + 18i \\ \hline 5 + 8i \end{array}$$

Multiplying Complex Numbers

just like normal multiplication, but remember that $i^2 = -1$

$$\begin{aligned} & \overbrace{-4i(5-i)} \\ & -20i + 4i^2 \\ & -20i - 4 \\ & \underline{-4 - 20i} \end{aligned}$$

$$\begin{aligned} & 3i(2-3i) \\ & 6i - 9i^2 \\ & 6i + 9 \\ & \underline{9 + 6i} \end{aligned}$$

$$\begin{aligned} & 5i(4+7i) \\ & 20i + 35i^2 \\ & 20i - 35 \\ & \underline{-35 + 20i} \end{aligned}$$

$$\begin{aligned} & (2+5i)(3-2i) \\ & 6 - 4i + 15i - 10i^2 \\ & 6 + 11i - 10i^2 \\ & 6 + 11i + 10 \\ & \underline{16 + 11i} \end{aligned}$$

$$\begin{aligned} & (3+4i)(3-4i) \\ & 9 - 12i + 12i - 16i^2 \\ & 9 + 16 = \underline{25} \end{aligned}$$

$$(-2-2i)^2$$

$$\begin{aligned} & (3+2i)^2 \\ & (3+2i)(3+2i) \\ & 9 + 6i + 6i + 4i^2 \\ & 9 + 12i + 4i^2 \\ & \underline{9 + 12i - 4} \\ & \underline{5 + 12i} \end{aligned}$$

