

HW 2B.1

$$\textcircled{\#14} \quad \frac{(8-4i)(5+7i)}{(5-7i)(5+7i)} = \frac{(8-4i)(5+7i)}{74}$$

$$25 + 49 = 74$$

$$= \frac{68 + 36i}{74}$$

$$\begin{array}{r|l} & 8 \quad -4i \\ 5 & 40 \quad -20i \\ 7i & 56i \quad -28i^2 \\ & \quad \quad 28 \end{array}$$

$$68 + 36i$$

$$= \frac{\cancel{74}(34 + 18i)}{\cancel{74}37}$$

$$= \frac{34 + 18i}{37} \text{ or } \frac{34}{37} + \frac{18}{37}i$$

$$\textcircled{\#13} \quad \frac{8i(-1+10i)}{(-1-10i)(-1+10i)} = \frac{8i(-1+10i)}{101}$$

$$1^2 + 10^2 = 101$$

$$= \frac{-8i + 80i^2}{101}$$

$$= \boxed{\frac{-8i - 80}{101}}$$

28.2 Dividing Polynomials - Synthetic Division

(EX1) Divide $3x^3 - x^2 + 2x - 3$ by $x - 2$ using synthetic division.

$$\begin{array}{r|rrrr} 2 & 3 & -1 & 2 & -3 \\ & \downarrow & 6 & 10 & 24 \\ \hline & 3 & 5 & 12 & 21 \end{array}$$

$$3x^2 + 5x + 12 + \frac{21}{x-2}$$

Divide $4x^4 - 2x^2 - x + 1$ by $x + 2$

$$\begin{array}{r|rrrrr} -2 & 4 & 0 & -2 & -1 & 1 \\ & \downarrow & -8 & 16 & -28 & 58 \\ \hline & 4 & -8 & 14 & -29 & 59 \end{array}$$

Hold the place for x^3

$$4x^3 - 8x^2 + 14x - 29 + \frac{59}{x+2}$$

GP

Divide $2x^3 - 5x^2 + x - 8$ by $x - 3$

$$\begin{array}{r|rrrr} & 2 & -5 & 1 & -8 \\ 3 & \downarrow & 6 & 3 & 12 \\ \hline & 2 & 1 & 4 & \textcircled{4} \end{array}$$

$$2x^2 + x + 4 + \frac{4}{x-3}$$