

HW 11D: 2cgh, 3, 4, 5

2) c.) $(x+yi)(2-i) = 8+i$

$$\therefore x+yi = \frac{(8+i)(2+i)}{(2-i)(2+i)} \Rightarrow \frac{16+8i+2i+i^2}{4-i^2} \Rightarrow \frac{15+10i}{5} \Rightarrow 3+2i$$

$\therefore \boxed{x=3, y=2}$

g.) $(x+i)(3-yi) = 1+13i$

$$\therefore 3x - xyi + 3i - yi^2 = 1 + 13i \Rightarrow (3x+y) - xyi = 1 + 10i$$

$$\therefore 3x+y=1 \quad \& \quad -xy=10 \Rightarrow -x(-3x+1)=10$$

$\Rightarrow y = -3x+1$ substitute

$$\therefore y = -3\left(\frac{-5}{3}\right) + 1 \Rightarrow 5+1 \Rightarrow 6$$

$$y = -3(2) + 1 \Rightarrow -6+1 \Rightarrow -5$$

$$\therefore x = \frac{-5}{3} \text{ or } x=2 \text{ (plug into eq. for } y)$$

$\therefore \boxed{x = \frac{-5}{3}, y=6 \text{ or } x=2, y=-5}$

h.) $(x+yi)(2+i) = 2x - (y+1)i$

$$\therefore x+yi = \frac{2x-(y+1)i}{(2+i)} \frac{(2-i)}{(2-i)} \Rightarrow \frac{4x-2xi-2(y+1)i+i^2(y+1)}{4-i^2}$$

$$\Rightarrow x+yi = \frac{(4x-y-1) - 2(x+y+1)i}{5}$$

$$\therefore x = \frac{4x-y-1}{5} \quad \& \quad y = \frac{-2(x+y+1)}{5}$$

$$\Rightarrow 5x = 4x - y - 1 \Rightarrow 5y = -2x - 2y - 2$$

$$\Rightarrow x = -y - 1 \Rightarrow 7y = -2x - 2$$

substitute

$$7y = -2(-y-1) - 2$$

$$7y = 2y + 2 - 2$$

$$5y = 0 \therefore y = 0$$

$$x = 0 - 1 \therefore x = -1$$

$\boxed{y=0}$
 $\boxed{x=-1}$

