

Quiz 10

$$1) \frac{2+i}{8-6i} + (1+i)^2 = \frac{(2+i)(8+6i)}{(8-6i)(8+6i)} + (1^2 + 2i + i^2)$$

$$= \frac{16 + 12i + 8i + 6i^2}{64 + \cancel{48i} - \cancel{48i} - 36i^2} + \cancel{1} + 2i - \cancel{1}$$

$$\stackrel{(i^2 = -1)}{=} \frac{16 + 20i - 6}{64 + 36} + 2i = \frac{\cancel{10} + 20i}{\cancel{100}} + 2i =$$

$$= \frac{1}{10} + \frac{2}{10}i + 2i = 0.1 + 0.2i + 2i = 0.1 + 2.2i$$

$$2) \quad i^{44} = (i^4)^{11} = 1$$

$$i^{45} = i^{44} \cdot i = 1 \cdot i = i$$

$$i^{46} = i^{45} \cdot i = i \cdot i = i^2 = -1$$

$$\text{So, } i^{44} + i^{45} - i^{46} + (2i)^2 = 1 + i - (-1) + 4i^2$$

$$\stackrel{(i^2=-1)}{=} 1 + i + 1 - 4 = -2 + i$$