

**Exercise 2.5****Q. 1: Evaluate:**

$$\begin{aligned}
 \text{(i)} \quad i^7 &= i^6 \cdot i^1 \\
 &= (i^2)^3 \cdot i^1 \\
 &= (-1)^3 \cdot i^1 \\
 &= -i
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii)} \quad i^{50} &= i^{50} \\
 &= (i^2)^{25} \\
 &= (-1)^{25} \\
 &= -1
 \end{aligned}$$

$$\begin{aligned}
 \text{(iii)} \quad i^{12} &= i^{12} \\
 &= (i^2)^6 \\
 &= (-1)^6 \\
 &= 1
 \end{aligned}$$

$$\begin{aligned}
 \text{(iv)} \quad (-i)^8 &= i^8 \\
 &= (i^2)^4 \\
 &= (-1)^4 \\
 &= 1
 \end{aligned}$$

$$\begin{aligned}
 \text{(v)} \quad (-i)^5 &= -i^5 \\
 &= -(i^2)^2 \cdot i^1 \\
 &= -(-1)^2 \cdot i^1 \\
 &= -i
 \end{aligned}$$

$$\begin{aligned}
 \text{(vi)} \quad i^{27} &= i^{26} \cdot i^1 \\
 &= (i^2)^{13} \cdot i^1 \\
 &= (-1)^{13} \cdot i^1 \\
 &= -i
 \end{aligned}$$

**Q. 2: Write the conjugate of the following numbers.**

$$\begin{aligned}
 \text{(i)} \quad 2 + 3i \\
 \text{let } x &= 2 + 3i \\
 \text{then conjugate is: } \bar{x} &= \overline{2 + 3i} \\
 &= \bar{2} + \bar{3i} \\
 &= 2 - 3i
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii)} \quad 3 - 5i \\
 \text{let } x &= 3 - 5i \\
 \text{then conjugate is: } \bar{x} &= \overline{3 - 5i} \\
 &= \bar{3} - \bar{5i} \\
 &= 3 + 5i
 \end{aligned}$$

$$\begin{aligned}
 \text{(iii)} \quad -i \\
 \text{let } x &= -i \\
 \text{then conjugate is: } \bar{x} &= \overline{-i}
 \end{aligned}$$

$$= i$$

(iv)  $-3 + 4i$

let  $x = -3 + 4i$

then conjugate is:  $\bar{x} = \overline{-3 + 4i}$   
 $= \overline{-3} + \overline{4i}$   
 $= -3 - 4i$

(v)  $-4 - i$

let  $x = -4 - i$

then conjugate is:  $\bar{x} = \overline{-4 - i}$   
 $= \overline{-4} - \bar{i}$   
 $= -4 + i$

(vi)  $i - 3$

let  $x = -3 + i$

then conjugate is:  $\bar{x} = \overline{-3 + i}$   
 $= \overline{-3} + \bar{i}$   
 $= -3 - i$

**Q. 3: Write the real and imaginary part of the following numbers.**

(i)  $1 + i$

Real Part: 1

Img Part:  $i$

(ii)  $-1 + 2i$

Real Part: -1

Img Part:  $2i$

(iii)  $-3i + 2$

Real Part: 2

Img Part:  $-3i$

(iv)  $-2 - 2i$

Real Part: -2

Img Part:  $-2i$

(v)  $-3i$

Real Part: 0

Img Part:  $-3i$

(vi)  $2 + 0i$

Real Part: 2

Img Part:  $0i$

**Q. 4: Find the value of  $x$  and  $y$  if  $x + iy + 1 = 4 - 3i$ .**

as:  $x + iy + 1 = 4 - 3i$

$$(x + 1) + (y)i = (4) + (-3)i$$

Comparing real and imaginary parts

Real parts:  $x + 1 = 4$

$$x = 4 - 1$$

Visit for other book notes, past papers, tests papers and guess papers

taleemcity.com

Imaginary parts:  $x = 3$   
 $y = -3$

[taleemcity.com](http://taleemcity.com)