

Questions from Homework

$$\textcircled{1} b) i^7 + i^{23} + i^{94} + i^{112}$$

$$(i^4 \cdot i^3) + (i^{20} \cdot i^3) + (i^{92} \cdot i^2) + (1)$$

$$-i + (-i) + (-1) + 1$$

$$\boxed{-2i}$$

$$c) (\sqrt{-16})(\sqrt{-49})(\sqrt{-27})(\sqrt{-12})$$

$$(4i)(7i)(3i\sqrt{3})(2i\sqrt{3}) \rightarrow 504i^4$$

$$(28i^2)(6i^2(3)) \rightarrow \boxed{504}$$

$$(28i^2)(18i^2)$$

$$504(i^4)$$

$$\boxed{504}$$

$$\textcircled{1} d) i^{-5} + i^{-11} + i^{-18} + i^{-196}$$

$$(i^{-4} \cdot i^{-1}) + (i^{-8} \cdot i^{-3}) + (i^{-16} \cdot i^{-2}) + (1)$$

$$-i + i - 1 + 1$$

$$\boxed{0}$$

Number	"a"	"b"	O.P.	Modulus
④ <u>-2</u> + <u>5i</u>	-2	5	(-2, 5)	$\sqrt{29}$
$\sqrt{7} - \sqrt{-36}$ = <u>$\sqrt{7}$</u> - <u>6i</u>	$\sqrt{7}$	-6	($\sqrt{7}$, -6)	$\sqrt{43}$

$$\textcircled{3} z = \boxed{5 - 11i}$$

$$\text{a) } \bar{z} = \boxed{5 + 11i}$$

$$\text{b) } \boxed{5 - 11i} + (5 + 11i)$$

$$= \boxed{10}$$

$$\text{c) } \boxed{5 - 11i} - (5 + 11i)$$

$$5 - 11i - 5 - 11i$$

$$= \boxed{-22i}$$

Positive Powers of "i"

$$i^1 = i$$

$$i^2 = -1$$

$$i^3 = -i$$

$$i^4 = 1$$

Negative Powers of "i"

$$i^{-1} = -i$$

$$i^{-2} = -1$$

$$i^{-3} = i$$

$$i^{-4} = 1$$

Notice a pattern?

For positive powers take out the largest multiple of 4
For negative powers take out the largest multiple of -4

Examples

$$i^1 = i$$

$$i^2 = -1$$

$$i^3 = -i$$

$$i^4 = 1$$

$$i^{-1} = -i$$

$$i^{-2} = -1$$

$$i^{-3} = i$$

$$i^{-4} = 1$$

$$i^8 + i^{33} + i^{83} - i^{132}$$

$$(1) + (i) + (-i) - (1)$$

$$\boxed{0}$$

$$i^{-9} + i^{-28} + i^{-83} - i^{-129}$$

$$(i^{-8} \cdot i^{-1}) + (1) + (i^{-80} \cdot i^{-3}) - (i^{-128} \cdot i^{-1})$$

$$(-i) + (1) + (i) - (-i)$$

$$\boxed{1+i}$$

Simplify the following!

$$\frac{(2+3i)(3-i)}{(1-5i)(2+4i)}$$

$$\frac{6+7i-3(i^2)}{2-6i-20(i^2)}$$

$$\frac{(9+7i)(22+6i)}{(22-6i)(22+6i)}$$

$$\frac{198+54i+154i+42(i^2)}{484-36(i^2)}$$

$$\frac{198+208i-42}{484+36}$$

$$\frac{156+208i}{520}$$

$$\frac{156}{520} + \frac{208i}{520}$$

$$\boxed{\frac{3}{10} + \frac{2i}{5}}$$