Answers: Arithmetic on complex numbers

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Summary

Answers to questions relating to the guide on arithmetic on complex numbers.

These are the answers to Questions: Arithmetic on complex numbers.

Please attempt the questions before reading these answers!

Q1

1.1. $(5+7i)-(2+3i)=3+4i$

1.2. $(8+6i)+(2-4i)=10+2i$

1.3. $(4-i\sqrt{2})-(3+i\sqrt{7})=1-(\sqrt{2}+\sqrt{7})i$

1.4. $(\sqrt{8}+4i)-(\sqrt{5}+2i)=(2\sqrt{2}-\sqrt{5})+2i$

1.5. $(\sqrt{7}+3i)+(2-i)=(\sqrt{7}+2)+2i$

1.6. $(5+i\sqrt{2})-(7-i)+(\sqrt{3}+4i)=(\sqrt{3}-2)+(\sqrt{2}+5)i$

Q2

2.1. $(2+3i)(4+5i)=-7+22i$

2.2. $(3+i)(2-i)=7-i$

2.3. $4(6+3i)=24+12i$

2.4. $(1+i)^2=0+2i=2i$

2.5. $(3+2i)^3=-9+46i$

2.6. $(7-4i)^2(i-2)=-10+145i$

2.7. $(1-i\sqrt{3})^3=-8+0i=-8$

2.8. $(5-2i)(5+2i)=29+0i=29$

2.9. $(\sqrt{2}+i\sqrt{3})(\sqrt{8}-i\sqrt{3})=7+i\sqrt{6}$

Q3

3.1. $\dfrac{7-6i}{1+2i} = -1-4i$

3.2. $\dfrac{4-i}{1+4i} = 0-i = -i$

3.3. $\dfrac{3}{5i} = 0-\dfrac{3}{5}i = -\dfrac{3}{5}i$

3.4. $\dfrac{4+2i}{3-i} = 1+i$

3.5. $\dfrac{9+i}{i} = 1-9i$

3.6. $\dfrac{-2-2i}{-2+2i} = 0+i = i$

3.7. $\dfrac{1+5i}{-3i} = -\dfrac{5}{3}+\dfrac{1}{3}i$

3.8. $\dfrac{-4}{1-i} = -2-2i$

3.9. $\dfrac{1-3i}{1+2i} = -1-i$

Q4

4.1. $\dfrac{(6+4i)(3-i)}{2i} = 3-11i$

4.2. $3i(5-4i)+(6+2i) = 18+17i$

4.3. $(2+3i)(1-i)-(5-4i) = 0+5i = 5i$

4.4. $\dfrac{(5+2i)+(4-i)}{1+i} = 5-4i$

4.5. $\dfrac{(2+i)^3}{(3+i)-(1+i)} = 1+\dfrac{11}{2}i$

4.6. $(\dfrac{6-3i}{2(1-i)})^2 = \dfrac{9}{2}+\dfrac{27}{8}i$

Version history and licensing

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