Answer on Question #42292 – Math – Complex Analysis

$$(a+40i)+(9-40i)^{\frac{1}{2}}$$

Solution:

$$9-40i=9-2*20i=25-2*20i-16=5^2-2*5*4i+(4i)^2=(5-4i)^2$$

As the square root has two branches, we obtain $\sqrt{9-40i}=\pm(5-4i)$. Hence,

$$(a+40i)+(9-40i)^{\frac{1}{2}}=a+40i+5-4i=a+5+36i$$

or

$$(a+40i)+(9-40i)^{\frac{1}{2}}=a+40i-(5-4i)=a+40i-5+4i=a-5+44i$$

Answer:

$(a+40i)+(9-40i)^{\frac{1}{2}}=\ a+5+36i$ or $(a+40i)+(9-40i)^{\frac{1}{2}}=\ a-5+44i.$