

Пример расчета для опыта №1.

$$j := \sqrt{-1} = i$$

$$Ea := 164 \cdot \exp(j \cdot (-120)) = 133,5257 - 95,2202 \cdot i$$

$$Eb := 164 \cdot \exp(j \cdot 0) = 164$$

$$Ec := 164 \cdot \exp(j \cdot (120)) = 133,5257 + 95,2202 \cdot i$$

$$f := 60$$

$$\omega := 2 \cdot \pi \cdot f = 376,9911$$

$$Ra := 45$$

$$La := 0,281$$

$$Rb := 45$$

$$Lb := 0,281$$

$$Rc := 45$$

$$Lc := 0,281$$

$$Uab := Ea - Eb = -30,4743 - 95,2202 \cdot i$$

$$Ubc := Eb - Ec = 30,4743 - 95,2202 \cdot i$$

$$Uca := Eb - Ea = 30,4743 + 95,2202 \cdot i$$

$$Za := \sqrt{Ra^2 + (\omega \cdot La)^2} = 115,0961$$

$$\varphi a := \arctg\left(\omega \cdot \frac{La}{Ra}\right) = 1,1691$$

$$Zb := \sqrt{Rb^2 + (\omega \cdot Lb)^2} = 115,0961$$

$$\varphi b := \arctg\left(\omega \cdot \frac{Lb}{Rb}\right) = 1,1691$$

$$Zc := \sqrt{Rc^2 + (\omega \cdot Lc)^2} = 115,0961$$

$$\varphi c := \arctg\left(\omega \cdot \frac{Lc}{Rc}\right) = 1,1691$$

$$Ya := \frac{1}{Za} = 0,0087$$

$$Yb := \frac{1}{Zb} = 0,0087$$

$$Yc := \frac{1}{Zc} = 0,0087$$

$$ya := Ya \cdot \exp(j \cdot \varphi a) = 0,0034 + 0,008 \cdot i$$

$$|Uab| = 99,9779$$

$$yb := Yb \cdot \exp(j \cdot \varphi b) = 0,0034 + 0,008 \cdot i$$

$$|Ubc| = 99,9779$$

$$yc := Yc \cdot \exp(j \cdot \varphi c) = 0,0034 + 0,008 \cdot i$$

$$|Uca| = 99,9779$$

$$Iab := Uab \cdot ya = 0,6579 - 0,5672 \cdot i$$

$$Ibc := Ubc \cdot yb = 0,865 - 0,0798 \cdot i$$

$$Ica := Uca \cdot yc = -0,6579 + 0,5672 \cdot i$$

$$|Iab| = 0,8686$$

$$|Ica| = 0,8686$$

$$|Ibc| = 0,8686$$

$$Ia := Iab - Ica = 1,3159 - 1,1343 \cdot i$$

$$Ib := Ibc - Iab = 0,207 + 0,4874 \cdot i$$

$$Ic := Ica - Ibc = -1,5229 + 0,6469 \cdot i$$

$$|Ia| = 1,7373$$

$$Pa := Ia \cdot Uab \cdot \cos\left(\arctg\left(\omega \cdot \frac{La}{Ra}\right)\right) = -57,9077 - 35,4735 \cdot i$$

$$Pb := Ib \cdot Ubc \cdot \cos\left(\arctg\left(\omega \cdot \frac{Lb}{Rb}\right)\right) = 20,612 - 1,9007 \cdot i$$

$$Pc := Ic \cdot Uca \cdot \cos\left(\arctg\left(\omega \cdot \frac{Lc}{Rc}\right)\right) = -42,2293 - 48,9886 \cdot i$$