GIVEN: $V = 208 \angle -30$ V

$I = 5 \angle 15$ A

FIND: A) S

B) INDUCTIVE OR CAPACITIVE

C) pf

SOLN: A) $S = VI^* = (208 \angle -30)(5 \angle -15)$

$= \underline{1040 \angle -45^\circ \text{ VA}}$

B) SINCE $\theta = -45$ Q IS NEG AND LOAD IS <u>CAPACITIVE</u>

C) $pf = \cos(45) = \underline{0.707 \text{ LEADING}}$

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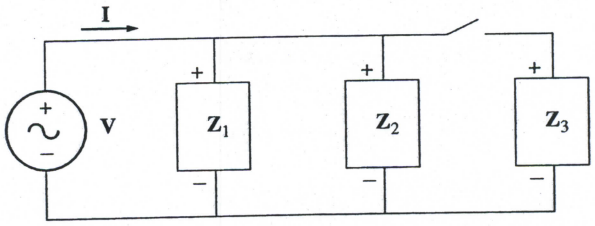
GIVEN: $120\angle 0^\circ$ V



$Z_1 = 5\angle 30^\circ\ \Omega \quad Z_2 = 5\angle 45^\circ\ \Omega \quad Z_3 = 5\angle -90^\circ\ \Omega$

FIND: A) I, pf, P, Q, $|S|$ w/ SWITCH OPEN

B) REPEAT A) w/ SWITCH CLOSED

C) WHAT HAPPENED TO I?

SOLN: A)

$$I_1 = \frac{120\angle 0}{5\angle 30} = 24\angle -30^\circ \text{ A}$$

$$I_2 = \frac{120\angle 0}{5\angle 45} = 24\angle -45^\circ \text{ A}$$

$$I = I_1 + I_2 = \underline{47.6\angle -37.5^\circ \text{ A}}$$

$$P = 120(47.6)\cos(37.5) = \underline{4.53 \text{ KW}}$$

$$Q = 120(47.6)\sin(37.5) = \underline{3.48 \text{ KVAR}}$$

$$pf = \cos(37.5) = \underline{0.793 \text{ LAGGING}}$$

$$|S| = |V||I| = 120(47.6) = \underline{5.71 \text{ KVA}}$$

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B) $I_3 = \frac{120 \angle 0}{5 \angle -90} = 24 \angle 90^\circ \text{ A}$

$I = I_1 + I_2 + I_3 = 38.1 \angle -7.5^\circ \text{ A}$

$P = 120(38.1)\cos(7.5) = \underline{4.53 \text{ KW}}$

$Q = 120(38.1)\sin(7.5) = 596 \text{ VAR}$

$pf = \cos(7.5) = 0.99$ LAGGING

$|S| = 120(38.1) = 4.57 \text{ KVA}$

C) I DECREASED! AS WELL AS $|S|$ ... BUT P REMAINED THE SAME

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