Sinusoid to phasor

$A sin(\omega t + \theta) = A cos(\omega t + 90 + \theta) = A \angle (\theta + 90)$
$B cos(w t + \theta) = B \angle \theta$

Phasor to sinusoid

$(-r + j4)A 5 \angle 126.87 = 5 cos(wt + 126...)$
$j8e^{-20} = j8 \angle-20 = (1\angle90)(9\angle-20) = 8 \angle 70$
The $(1\angle 90)$ is omdat vermenigvuldigen met j gewoon roteren met 90 is.

Differentieeren

$$ {dv \over dt} \rightarrow j \omega V $$

integreren

$$ \int v dt = {1\over j\omega} V = - \omega V
$$ (delen door j is vermenigvuldigen met -j)

Rotatie van phasors met 90

$$ A = r e^{j \theta} \rightarrow Aj = r e^{j (\theta + 90)} $$

Solving of diffEqs with phasors, example

$$ \begin{aligned} 4 \Bbb{}{I} + 8 \int i dt - 3 {di \over dt} &= 50 cos(2 t + 75) \ 4 I + 8 {1 \over j \omega} I - 3 j \omega I &= 50 \angle 75 \ \text{since t is 2, and dividing by j is multiplying with -j,} \ 4 I - 4 I j - 6 I j &= 50 \angle 75 \ I (4 - 10j) &= 50 \angle 75 \ I = {50 \angle 75 \over 4 - 10j} &= 4,64 \angle 143 \end{aligned} $$

Multiplying by j is phase shifting by 90 deg.

Phasor relationships

resistors

$$ V = I R = R im(cos(wt + \theta)) = R I_m \angle \theta $$

Inductors

Assume $I = Im(cos(w t + \theta)$ TOBECONTINUED