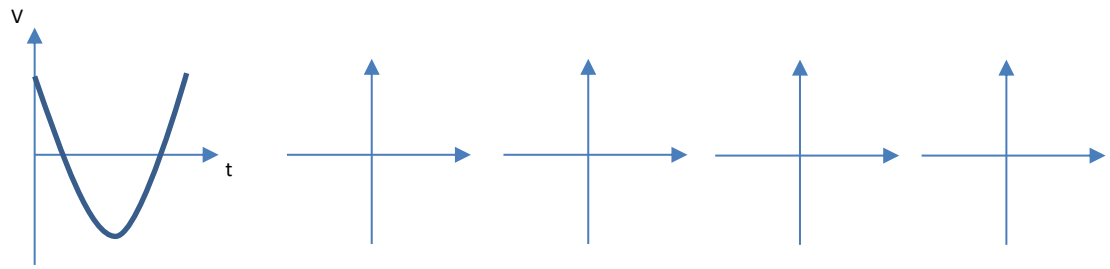
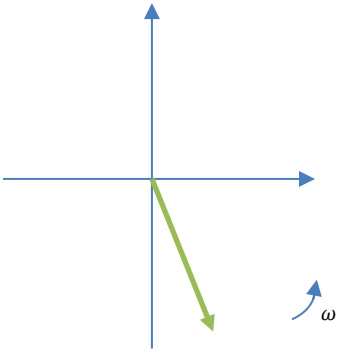
CONCEPT: PHASORS

- A PHASOR is just a rotating vector, whose information lies in its X-COMPONENT.
  - Phasors make representing oscillating information, like voltage and current, easy:

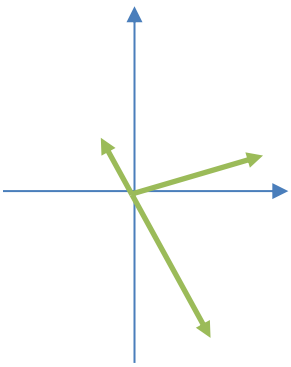


EXAMPLE 1: For the following voltage phasor, is the voltage positive or negative?



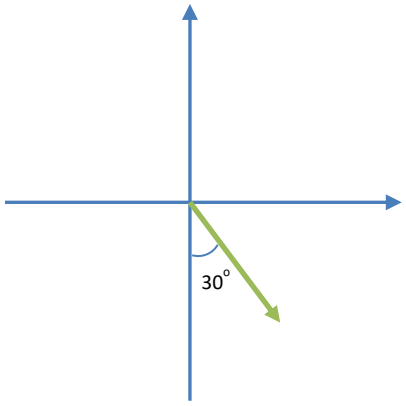
- Phasors obey all the same rules as vectors, such as addition, subtraction, etc.
  - To find the magnitude of a phasor, you can sum its components using the Pythagorean theorem, as with vectors.

EXAMPLE 2: In the following phasor diagram, find the direction of the "net phasor" for the three phasors shown. Is the resulting quantity the phasor describes positive or negative?



PRACTICE: ANGULAR FREQUENCY OF A PHASOR

The following phasor diagram shows an arbitrary phasor during its first rotation. Assuming that it begins with an angle of 0°, if the phasor took 0.027 s to get to its current position, what is the angular frequency of the phasor?

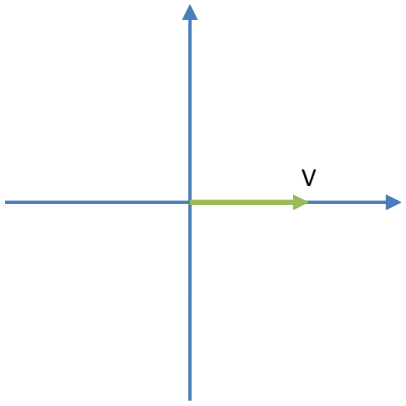


EXAMPLE: CONVERTING BETWEEN A FUNCTION AND A PHASOR

The current in an AC circuit is given by $i(t) = (1.5\ A)\cos[(377\ s^{-1})t]$. Draw the phasor that corresponds to this current at $t = 15\ ms$, assuming the phasor begins at 0°.

PRACTICE: DRAWING A VOLTAGE PHASOR

An AC source oscillates with an angular frequency of 120 s^{-1}. If the initial voltage phasor is shown in the following phasor diagram, draw the voltage phasor after 0.01 s.



PRACTICE: INSTANTANEOUS VALUE FROM A PHASOR

A phasor of length 4 begins at 0°. If it is rotating at $\omega = 250\ s^{-1}$, what is the value of the phasor after 0.007 s?