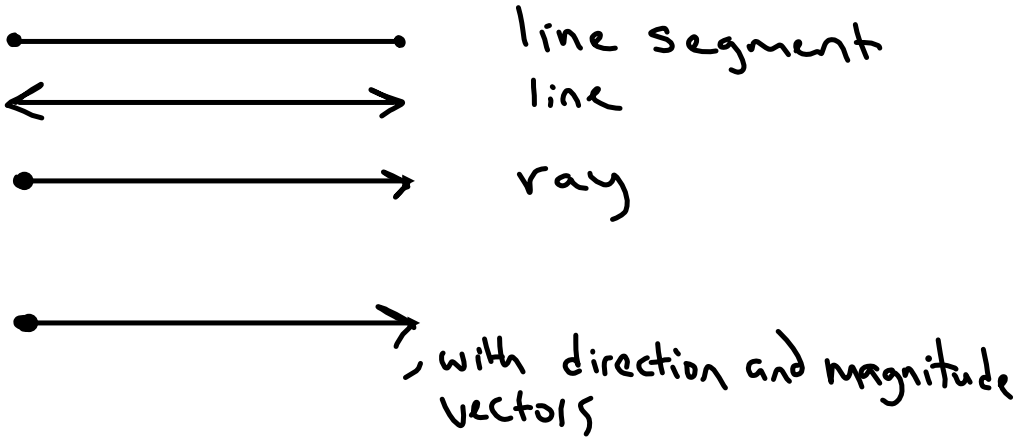

line segment
line
ray
with direction and magnitude
vectors

Vector PQ

$\overrightarrow{PQ}$

v

$\vec{v}$

Distance Formula

magnitude of $\overrightarrow{PQ}$

$$\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$$

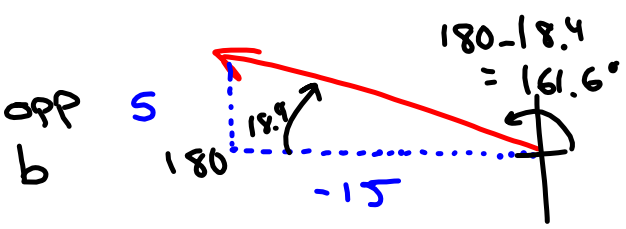
Find the hypotenuse

$\sqrt{c^2} = \sqrt{a^2+b^2}$

$c = \sqrt{a^2+b^2}$

$c = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

SOHCAHTOA



$\tan^{-1}(\quad)$

$\theta+180°$	θ
$\theta+180°$	$\theta+360°$

Direction

$\tan^{-1}\left(\frac{b}{a}\right) = \theta$

$\tan^{-1}\left(\frac{5}{-15}\right) = -18.4°$

$161.6°$

Find direction and magnitude.

$\overrightarrow{PQ} = \langle -7, 10 \rangle$ component

$-7i + 10j$ linear combination

$\|\overrightarrow{PQ}\| = \sqrt{(-7)^2 + 10^2}$

$= \sqrt{49 + 100}$

$= \sqrt{149}$

$\theta = \text{Tan}^{-1}\left(\frac{10}{-7}\right) = -55.00$

II $+180$

$124.99 = 125^\circ$

⑨ I $\left(\frac{2}{5}, 1\right)$ x_1 y_1

I $\left(1, \frac{2}{5}\right)$ x_2 y_2

$\langle 1-\frac{2}{5}, \frac{2}{5}-1 \rangle$

$\langle \frac{3}{5}, -\frac{3}{5} \rangle$

$\theta = \tan^{-1}\left(\frac{-3/5}{3/5}\right) = -45°$

π $+360$

$315°$

+180 ✓

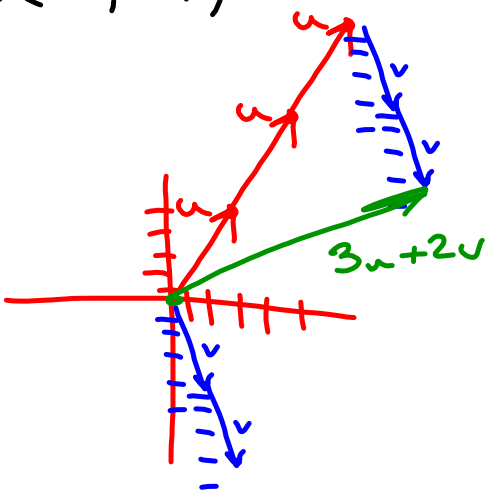
$+180$ $+360$ IV

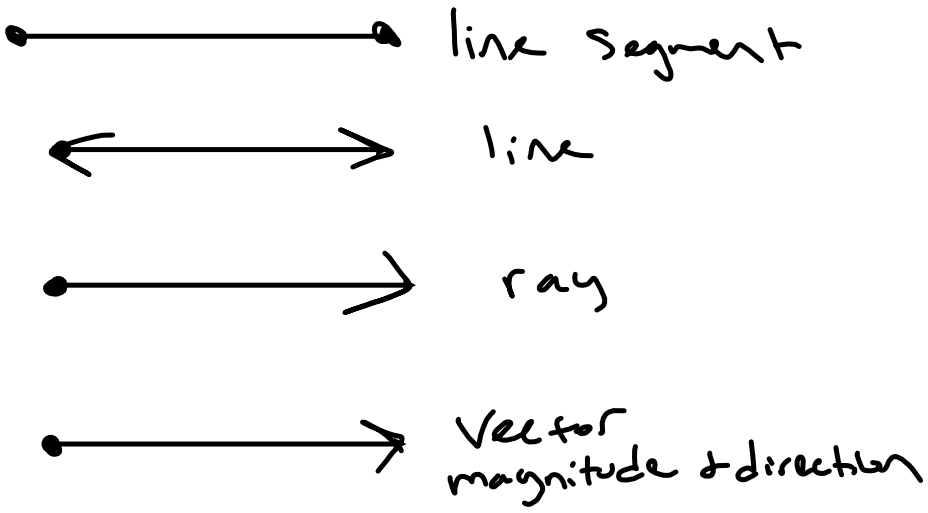
$\|\vec{IT}\| = \sqrt{\left(\frac{3}{5}\right)^2 + \left(\frac{-3}{5}\right)^2}$

$= \sqrt{\frac{18}{25}} = \frac{3\sqrt{2}}{5}$

$u = \langle 3, 5 \rangle \quad v = \langle 2, -4 \rangle$

$3u + 2v = \langle 13, 7 \rangle$




line segment
line
ray
vector
magnitude & direction

$\overrightarrow{PQ}$

$\vec{v}$

Distance Formula

Magnitude of vector

$$\left\| \overrightarrow{PQ} \right\| = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$$

Hypotenuse

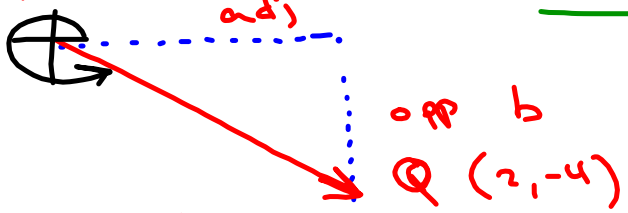
$$\sqrt{c^2} = \sqrt{a^2+b^2}$$

$$c = \sqrt{a^2+b^2}$$

$$= \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$$

neat.

Direction θ



$\theta = \tan^{-1}\left(\frac{b}{a}\right)$

$= \tan^{-1}\left(\frac{-9}{9}\right)$

$= -45°$

IV

$+360$

$315°$

component $\langle 9,-9 \rangle$

IV

$\tan\theta$	
$\theta+180°$	θ
$\theta+180°$	$\theta+360$

180

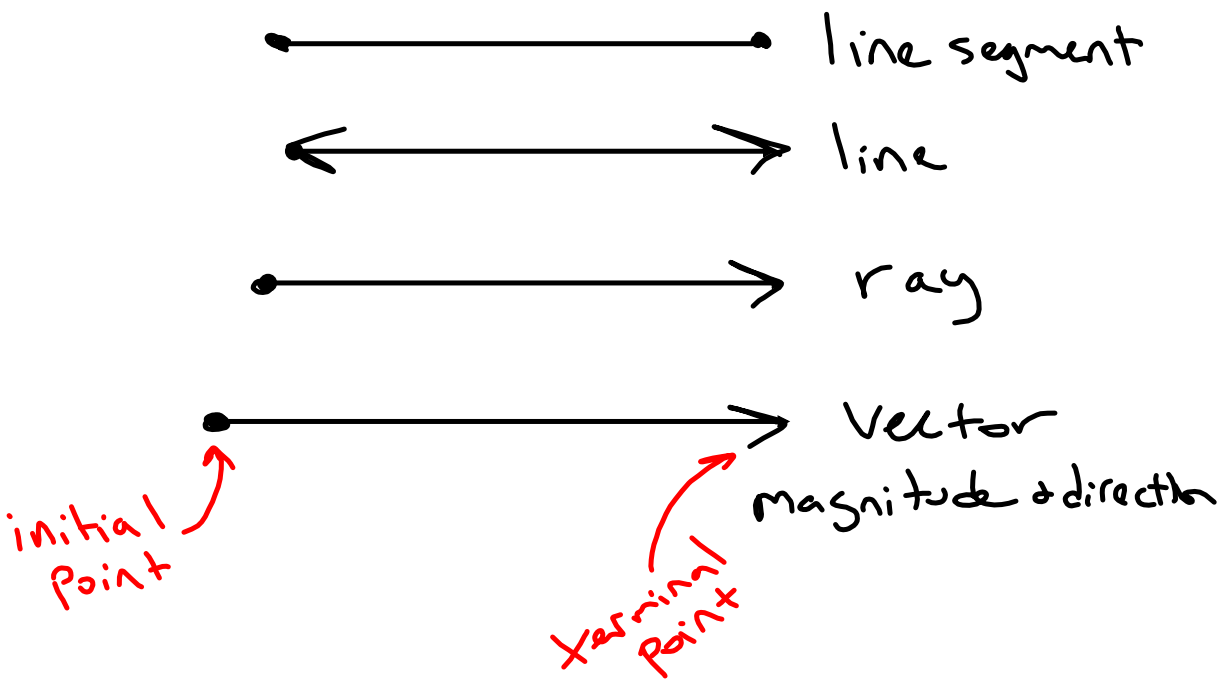
$P(3,8)$
$Q(-4,18)$

$(-4-3)$
$(18-8)$

$\langle -7, 10 \rangle$

$\tan^{-1}\left(\frac{10}{-7}\right) = -55.00$

-55.00
$+ \quad 180$
125


line segment
line
ray
Vector
magnitude & direction
initial point
terminal point

$\overrightarrow{PQ}$

$\vec{v}$

Distance Formula

$= \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$

Magnitude of vectors

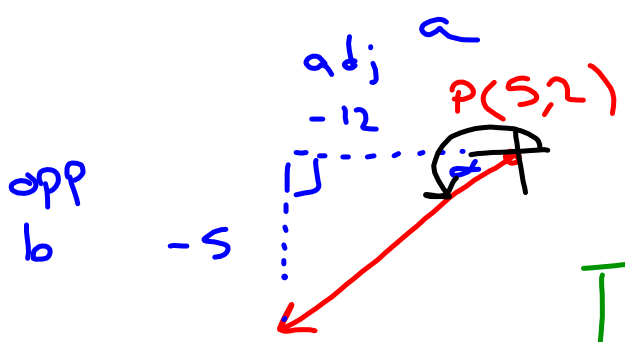
Hypotenuse

$\sqrt{c^2} = \sqrt{a^2+b^2}$

$c = \sqrt{a^2+b^2}$

$= \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$

Direction of $\vec{PQ}$



$$\theta = \tan^{-1}\left(\frac{b}{a}\right)$$

$$= \tan^{-1}\left(\frac{-5}{-12}\right)$$

$$= 22.62°$$

III $+180$

$202.62°$

$\tan\theta$	
$\theta + 180$	θ
180	360
$\theta + 180$	$\theta + 360$