1) Given the points $P(2,-5)$ and $Q(6,5)$ find a vector of length 3 that is in the same direction as $\overrightarrow{QP}$.

The first step is to find the vector starting at point Q and ending at point P.

$\overrightarrow{QP} = \langle 2-6, -5-5 \rangle = \langle -4, -10 \rangle$

Now compute the length of this vector.

$|\overrightarrow{QP}| = \sqrt{(-4)^2+(-10)^2} = \sqrt{116}$

A unit vector in the direction of $\overrightarrow{QP}$ is $\frac{1}{\sqrt{116}}\langle -4, -10 \rangle$

Now multiply the unit vector by 3 to get a vector of length 3.

$\frac{3}{\sqrt{116}}\langle -4, -10 \rangle = \left\langle \frac{-12}{\sqrt{116}}, \frac{-30}{\sqrt{116}} \right\rangle$

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