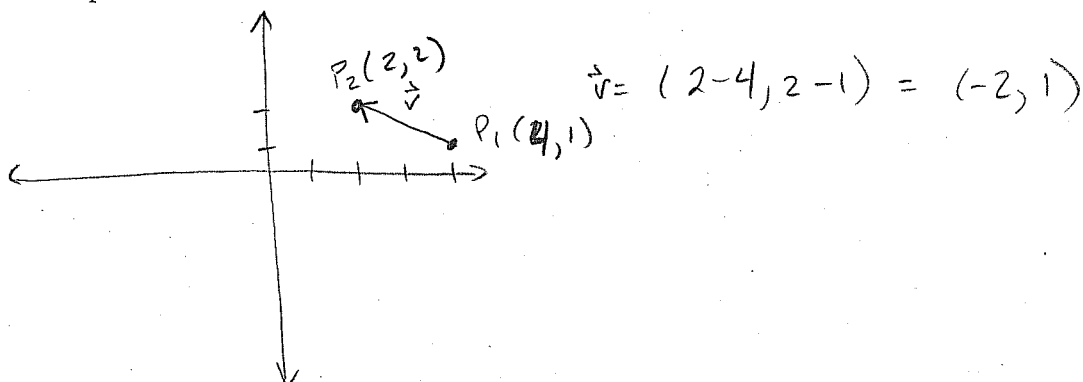


Quiz 7

Question 1. (2 marks) Graph the vector between the initial point $P_1(4, 1)$ and $P_2(2, 2)$. Find the components of this vector.



Question 2. (6 marks) Let $\vec{v} = (-3, 0, 1)$, $\vec{u} = (2, 1, 0)$, and $\vec{w} = (3, -2, -1)$. Find:

$$\begin{aligned} \text{(a) } 3\vec{v} - 2\vec{w} &= 3(-3, 0, 1) - 2(3, -2, -1) \\ &= (-9, 0, 3) - (6, -4, -2) \\ &= (-15, 4, 5) \end{aligned}$$

$$\begin{aligned} \text{(b) } -4(\vec{u} + 3\vec{w}) &= -4((2, 1, 0) + 3(3, -2, -1)) = -4(11, -5, -3) \\ &= (-44, 20, 12) \end{aligned}$$

$$\begin{aligned} \text{(c) } \|\vec{u}\| + \|\vec{v}\| &= \|(2, 1, 0)\| + \|(-3, 0, 1)\| = \sqrt{(2)^2 + (1)^2 + (0)^2} + \sqrt{(-3)^2 + (0)^2 + (1)^2} \\ &= \sqrt{4+1+0} + \sqrt{9+0+1} = \sqrt{5} + \sqrt{10} \end{aligned}$$

Question 3. (2 marks) The vector with components $\vec{v} = (0, 3, -1)$ has terminal point $P_2(1, -1, 0)$. Find the initial point P_1 .

$$\text{LET } P_1(x, y, z) \Rightarrow (1-x, -1-y, 0-z) = (0, 3, -1)$$

$$\therefore 1-x = 0 \Rightarrow x = 1$$

$$-1-y = 3 \Rightarrow y = -4$$

$$0-z = -1 \Rightarrow z = 1$$

$$\therefore P_1(1, -4, 1)$$