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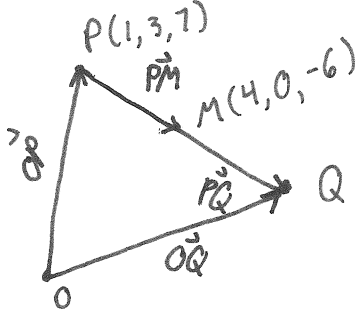
Quiz 8

This quiz is graded out of 8 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

Question 1. §3.1 #27 **Only** use vectors to solve the following. Let P be the point $(1,3,7)$. If the point $(4,0,-6)$ is the midpoint of the line segment connecting P and Q, what is Q?



$\vec{OQ} = \vec{OP} + 2\vec{PM}$

$= (1,3,7) + 2(3,-3,-13)$

$= (7,-3,-19)$

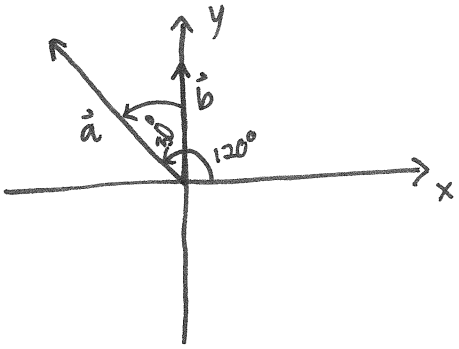
$\vec{OP} = (1,3,7)$

$\vec{PM} = M - P$

$= (4,0,-6) - (1,3,7) = (3,-3,-13)$

Question 2. §3.2 #13

Suppose that a vector $\vec{a}$ in the xy-plane has a length of 9 units and points in a direction that is 120° counterclockwise from the positive x-axis, and a vector $\vec{b}$ in that plane has a length of 5 units and points in the positive y-direction. Find $\vec{a} \cdot \vec{b}$.



$\vec{a} \cdot \vec{b} = \|\vec{a}\|\|\vec{b}\| \cos\theta$

$= 9 \cdot 5 \cos 30°$

$= 45 \frac{\sqrt{3}}{2}$