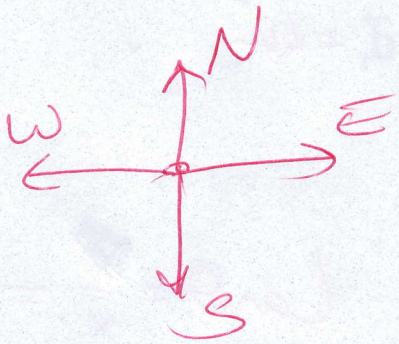
Mechanics I – Quiz 2 - F

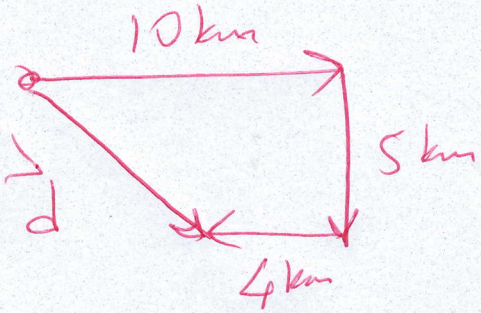
2019-2020

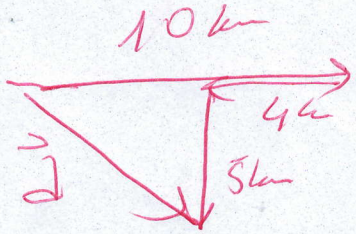
Full Name: KEY

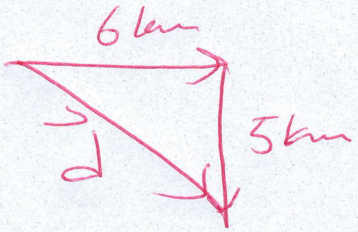
Choose one of the questions and answer. (2 marks)

1. A driver moves his car 10 km due East then 5 km to the South. Finally, he makes a right turn and travels another 4 km to the West. What is the magnitude of the displacement of the driver? Answer the question by vector addition method.





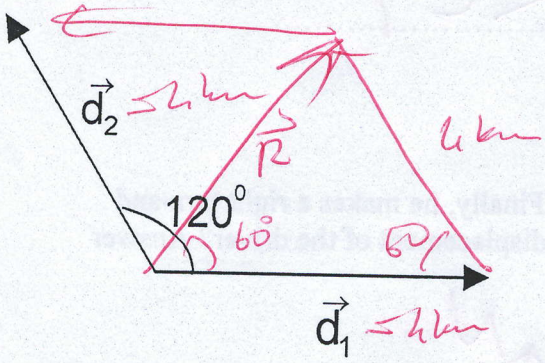




$d = \sqrt{5^2 + 6^2}$

$= 7,8 \text{ km}$

2. Find the sum of the vectors shown in the figure. Show the angle of the the resultant vector. $d_1 = 4$ m and $d_2 = 4$ m



$\vec{d}_1 = 4\hat{i}$

$\vec{d}_2 = 4\cos 120\,\hat{i} + 4\sin 120\,\hat{j}$

$\vec{d}_2 = 4(-0.5)\hat{i} + 4(0.86)\hat{j}$

$\vec{d}_2 = -2\hat{i} + 3.46\hat{j}$

$R = d_1 + d_2 = 2\hat{i} + 3.46\hat{j}$

$\tan\theta = \frac{Y}{X} = \frac{3.46}{+2}$ $\quad \theta = \tan^{-1}\left(\frac{3.46}{+2}\right)$

$\theta = \tan^{-1}(+1.73)$

$= 60°$