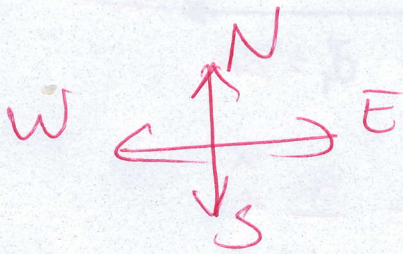
Mechanics I – Quiz 2 - E

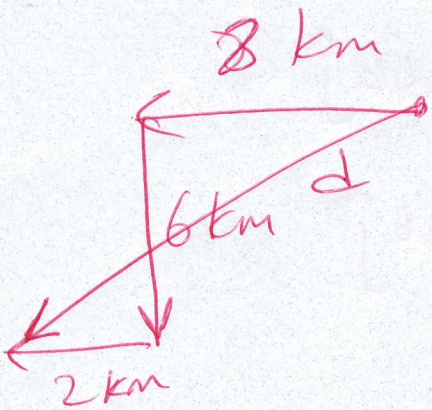
2019-2020

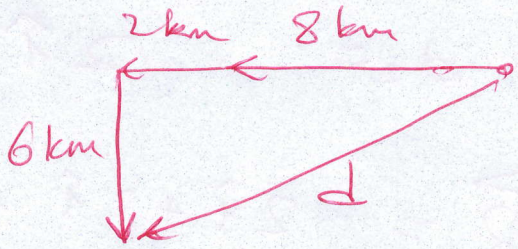
Full Name:..... KEY

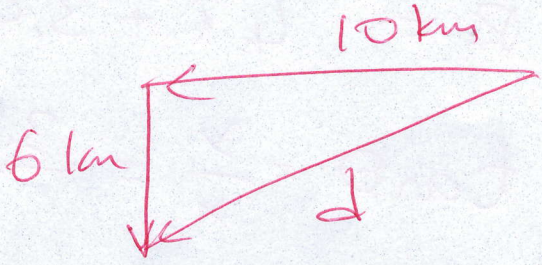
Choose one of the questions and answer. (2 marks)

1. A driver moves his car 8 km due West then 6 km to the South. Finally, he makes a right turn and travels another 2 km to the West. What is the magnitude of the displacement of the driver? Answer the question by vector addition method.







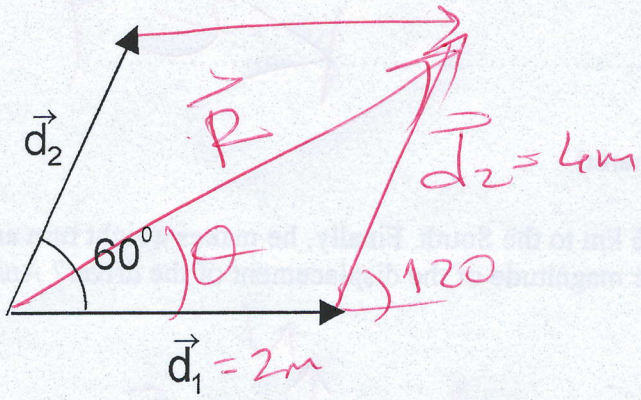


$d^2 = 6^2 + 10^2$

$d = \sqrt{136}$

$d = 11.7$ km

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



$d_1 = 2\hat{i}$

$d_2 = 4\cos 60\,\hat{i} + 4\sin 60\,\hat{j}$

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

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

$\vec{R} = 4\hat{i} + 3.46\hat{j}$

$\tan\theta = \frac{y}{x} = \frac{3.46}{4}$ $\quad \theta = \tan^{-1}(0.87)$

$\theta = 41°$