

MATH 113

EXAM III, Dec. 2, 2004 (1 hour)
MAKE-UP

NAME:

SECTION:

Instructor:

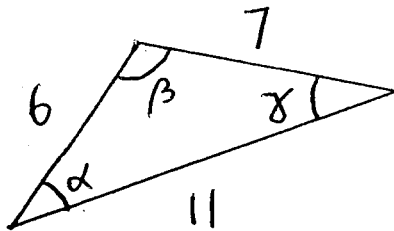
I	II	III	IV	V	Total
24	24	24	24	24	120

WHENEVER POSSIBLE, GIVE EXACT VALUES.
TO RECEIVE CREDIT FOR AN ANSWER,
YOU MUST SHOW WORK JUSTIFYING THAT ANSWERS.

24 points for each problem.

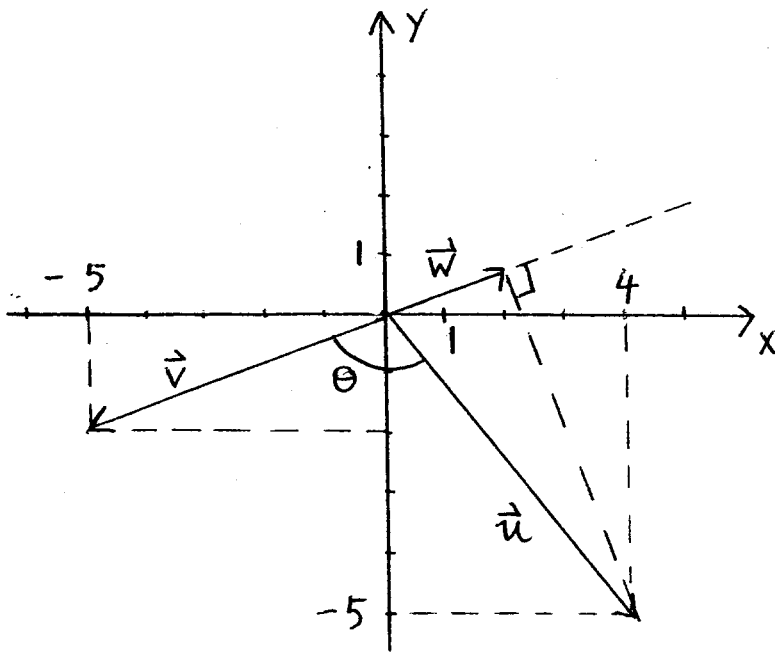
I. Set $\theta = \frac{2\pi}{3} + \sin^{-1}(\frac{3}{4})$. Evaluate exactly $\sin \theta$ and $\cos(\theta - \frac{\pi}{6})$.

II. Evaluate the angles in the triangle shown on the figure.

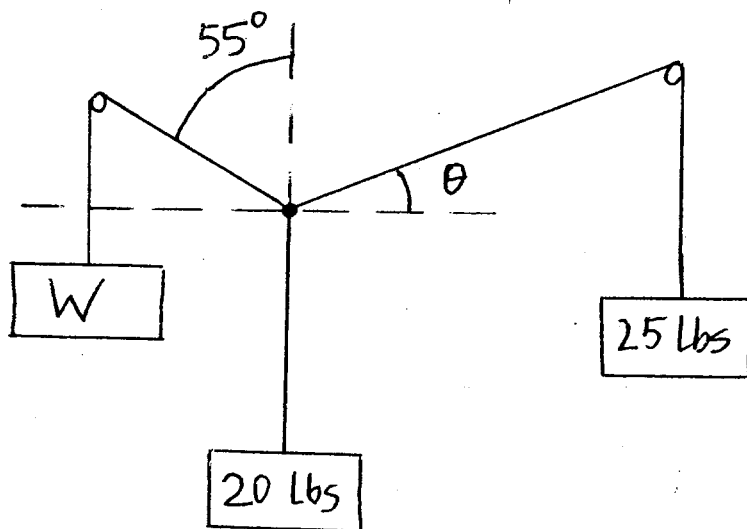


III. The vectors $\vec{U} = \langle 4, -5 \rangle$, $\vec{V} = \langle -5, -2 \rangle$ and \vec{W} are shown on the figure.

Evaluate exactly the lengths $|\vec{U}|$ and $|\vec{V}|$ of the vectors \vec{U} and \vec{V} . Evaluate the dot product $\vec{U} \cdot \vec{V}$. Give the exact value of the cosine of the angle θ . Evaluate exactly the length of the vector \vec{W} .



IV. Determine the weight W and the angle θ in order that the figure shows an equilibrium position.



V. On a river flowing south with a current of 7 mi/h, a boat cruises at a speed of 6 mi/h. The river is .8 wide. On the western bank there is a point A . Directly across it is point A' on the eastern bank. The boat starting from A has a compass heading of 25° (east of north). Where will the boat land? Upstream or downstream from A' ? At which distance? If part of the answer is obvious prior to any computation say it and explain it. How much time will crossing the river take?

