

MATHEMATICS 2210-3. Homework 1.

January 10, 2001

1. Problems # 7, 17, 29, 43, 50 from Section 13.1.

In # 7 and # 17 graph the curve with the given parametric representation. Is this curve closed? Is it simple? Obtain the Cartesian equation of the curve by eliminating the parameter.

Problem 7. $x = 1/s, y = s, 1 \leq s < 10$.

Problem 17. $x = 9 \sin^2(\theta), y = 9 \cos^2(\theta), 0 \leq \theta \leq \pi$.

Problem 29. Find dy/dx and d^2y/dx^2 without eliminating the parameter:

$$x = \frac{1}{1+t^2}, y = \frac{1}{t(1-t)}, 0 < t < 1.$$

Problem 43. Find the length of the parametric curve defined on the given interval:

$$x = 4\sqrt{t}, y = t^2 + \frac{1}{2t}, \frac{1}{4} \leq t \leq 1.$$

Problem 50. Find area of the surface generated by revolving the curve $x = \cos(t), y = 3 + \sin(t)$ for $0 \leq t \leq 2\pi$ around the x -axis.

2. Problems # 3, 6 from Section 13.2.

Problem 3. Draw the vector $\vec{w} = \vec{u}_1 + \vec{u}_2 + \vec{u}_3$.

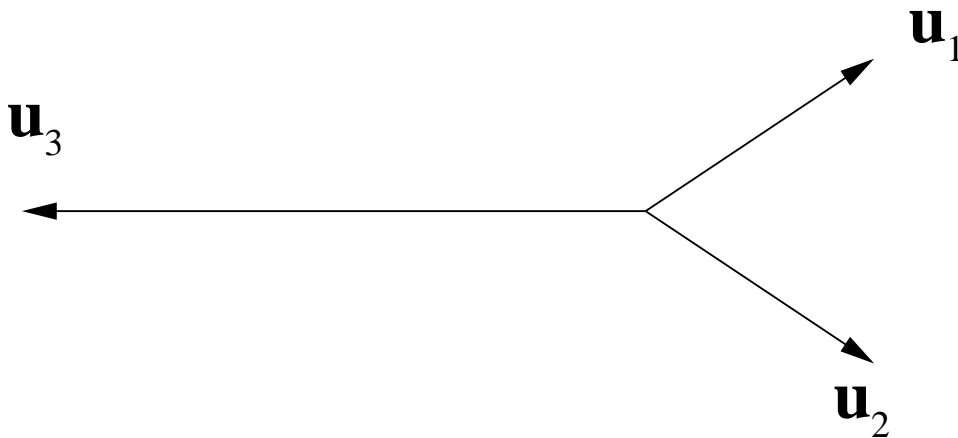


Figure 1: *Problem 3.*

Problem 6. In the large triangle \vec{m} is the median (it bisects the side to which it is drawn). Express \vec{m} and \vec{n} in terms of \vec{u} and \vec{v} .

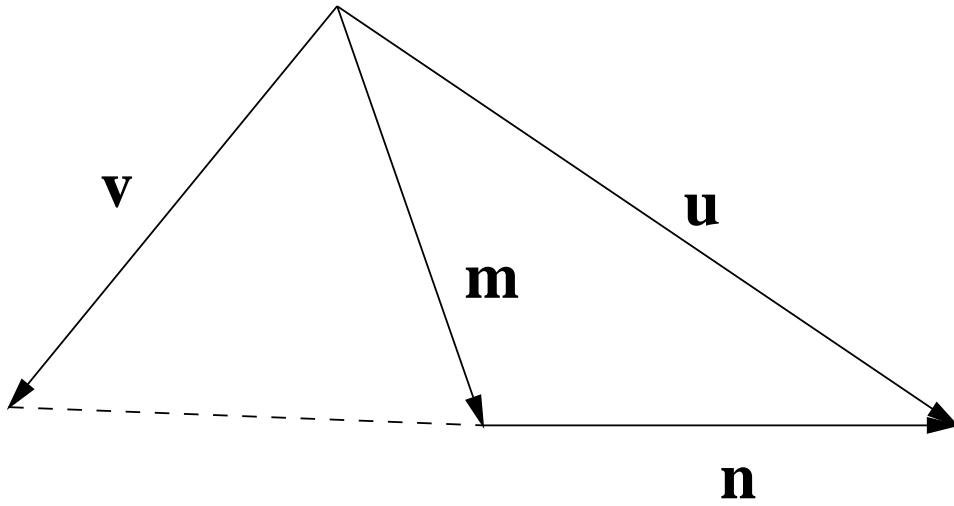


Figure 2: *Problem 6.*