MATH 1572H SAMPLE FINAL PROBLEMS

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The final exam will cover the Sections 10.1 - 10.9, 11.1 - 11.3, 12.1 - 12.4, 13.1 - 13.8, 14.1 - 14.4, 14.6, 15.1 - 15.4, 16.1 - 16.5, 18.1 - 18.4 In addition to the problems given below, please also study the previous exam/sample questions for the final exam.

1. Let a and b are vectors. Show that $|a \times b|^2 = |a|^2|b|^2 - (a \cdot b)^2$.

2. Find the area of the parallelogram with vertices $A(1,2,3)$, $B(1,3,6)$, $C(3,8,6)$, and $D(3,7,3)$.

3. Find the area enclosed by one loop of the four-leaved rose $r = cos(2\theta)$.

4. Find the length of the polar curve $r = \theta$, $0 \leq \theta \leq 2\pi$.

5. Identify and sketch the polar curves

    (a) $r = asin(\theta) + bcos(\theta)$, where a and b are constants with $ab \neq 0$.

    (b) $r = 3 + sin(\theta)$

6. A conic section is given by the polar equation $r = 10/(3 - 2cos(\theta))$. Find the eccentricity, identify the conic, locate the directrix, and sketch the conic.