

MATH 1552-02 Sample Test 2

June 29, 2004

Name: _____

Answer all questions on other sheets of paper. Write only your name on this page.

1. (10 points) Use vectors to find the angle between a diagonal of the cube and one of its edges.
2. (10 points) Find the area of the triangle with vertices $P(2, 1, 5)$, $Q(-1, 3, 4)$, $R(3, 0, 6)$.
3. (10 points) Find an equation of the plane that passes through the point $(1, -1, 1)$ and contains the line with symmetric equation $x = 2y = 3z$.
4. (10 points) Find the distance between the parallel planes $3x + 6y - 9z = 4$ and $x + 2y - 3z = 3$.
5. (10 points) Find an equation of the surface consisting of all points P for which the distance from P to the x -axis is twice the distance from P to the yz -plane. Identify the surface.
6. (10 points) Eliminate the parameter to find a Cartesian equation of the curve $x = \ln t$, $y = \sqrt{t}$, $t \geq 1$. Sketch the curve and indicate with an arrow the direction in which the curve is traced as the parameter increases.
7. (10 points) For which values of t is the curve $x = t^3 - 12t$, $y = t^2 - 1$ concave upward?
8. (10 points) Find the length of the curve $x = 1 + 3t^2$, $y = 4 + 2t^3$, $0 \leq t \leq 1$.
9. (10 points) Find the x and y coordinates of the points on the curve $r = \cos \theta + \sin \theta$ where the tangent line is horizontal or vertical.
10. (10 points) Use polar curves to derive the formula for the length of the circumference of the circle of radius a .