Calculus Test Chapter 11
Name ______________________
Identify the following.

1.  $x = y^2$

2.  $x^2 + y^2 = 3z^2$

3.  $\phi = \pi/4$

4.  $3x^2 + 3y^2 + 3z^2 = 9$

5.  $\rho = 8$

6.  $3x + 6z = 8$

7.  $x^2 - y^2 - 3z^2 = 18$

8.  $y = -3$

9.  $3x^2 - 4y^2 = 5z$

10.  $\theta = \pi/6$

11.  $y = 4x^2 + z^2$

12.  $3x^2 + y^2 + 6z^2 = 6$
Answer the following.

13. Express \((x, y, z) = (3, -3, 4)\) in cylindrical coordinates.

14. Express \((\rho, \theta, \phi) = (5, -\pi/2, \pi/6)\) in cylindrical coordinates.

15. Express \((r, \theta, z) = (6, 2\pi/3, 0)\) in spherical coordinates.

16. Change \(\rho = 1-\cos \theta\) to a rectangular equation.

17. Change \(x^2 - y^2 = 3z^2\) to a cylindrical equation.

18. Change \(r = 3\cos \theta\) to a Cartesian equation.

19. Write the symmetric equation of a vector through the points \((3, -1, 2)\) and \((-2, 4, 0)\).

20. Write the parametric equations of the line that passes through \((1, 0, -1)\) and is parallel to line \(x = 3, y = -1+6t, z = 9t\).

21. Write the equation of the plane passing through \((1, 1, 1)\), \((4, 3, -1)\), and \((5, -2, 3)\).

22. Write the equation of the plane containing the point \((4, -2, 3)\) and the line \((x-1)/2 = (y+1)/6 = (z-3)/-1\).

Evaluate the following if \(\mathbf{u} = <2, 2, 1>\) and \(\mathbf{v} = <4, 4, 2>\).

23. \(\mathbf{u} \times \mathbf{v}\) 24. \(\cos \theta\) 25. Unit vector in the direction of \(\mathbf{v}\) 26. Direction cosines of \(\mathbf{v}\) 27. \(\sin \theta\) 28. \(\mathbf{u} \cdot \mathbf{v}\) 29. Are \(\mathbf{u}\) and \(\mathbf{v}\) orthogonal? 30. What does \(|\mathbf{u} \times \mathbf{v}|\) represent? 30. Are \(\mathbf{u}\) and \(\mathbf{v}\) parallel?

31. \(\mathbf{u} + \mathbf{v}\) 32. \(3\mathbf{u} - \mathbf{v}\) 33. What does \(\mathbf{u} \times \mathbf{v}\) give you?