Preface

Here are a set of problems for my Calculus I notes. These problems do not have any solutions available on this site. These are intended mostly for instructors who might want a set of problems to assign for turning in. I try to put up both practice problems (with solutions available) and these problems at the same time so that both will be available to anyone who wishes to use them.

Cylindrical Coordinates

For problems 1 & 2 convert the Cartesian coordinates for the point into Cylindrical coordinates.

1. \((-3, 5, -8)\)
2. \((4, 1, 7)\)

3. Convert the following equation written in Cartesian coordinates into an equation in Cylindrical coordinates.

\[
\frac{x - y}{x^2 + y^2 + 1} = xyz
\]

For problems 4 – 6 convert the equation written in Cylindrical coordinates into an equation in Cartesian coordinates.

4. \(zr^3 \cos(\theta) = 4r + 8\)
5. \(r^2 - 3\sin(\theta) = z^3 + \sqrt{r^2} + 1\)
6. \(\tan(\theta) + 2z = 1 - r^2\)

For problems 7 – 9 identify the surface generated by the given equation.

7. \(z = -4r, \ z < 0\)
8. \(2r + 6\cos(\theta) + 9\sin(\theta) = \frac{51}{r}\)
9. \(\theta = \frac{\pi}{3}\)