MA 213 Worksheet #6
Section 12.6
9/11/18

1 *12.6.1* (a) What does the equation $y = x^2$ represent as a curve in $\mathbb{R}^2$.
(b) What does it represent as a surface in $\mathbb{R}^3$
(c) What does the equation $z = y^2$ represent?

2 Describe and sketch the surfaces.

12.6.3 $\quad x^2 + z^2 = 1$
12.6.7 $\quad xy = 1$

3 *12.6.11* Use traces to sketch and identify the surface $x = y^2 + 4z^2$.

4 Reduce the equation to one of the standard forms, classify the surface, and sketch it.
12.6.35 $\quad x^2 + y^2 - 2x - 6y - z + 10 = 0$
12.6.37 $\quad x^2 - y^2 + z^2 - 4x - 2z = 0.$

5 *12.6.43* Sketch the region bounded by the surfaces $z = \sqrt{x^2 + y^2}$ and $x^2 + y^2 = 1$ for $1 \le z \le 2$.

6 *12.6.17* Use traces to sketch and identify the surface $\dfrac{x^2}{9} + \dfrac{y^2}{25} + \dfrac{z^2}{4} = 1.$

(more on back)

21–28 Match the equation with its graph (labeled I–VIII). Give reasons for your choice.

21. $x^2 + 4y^2 + 9z^2 = 1$ **22.** $9x^2 + 4y^2 + z^2 = 1$

23. $x^2 - y^2 + z^2 = 1$ **24.** $-x^2 + y^2 - z^2 = 1$
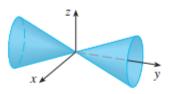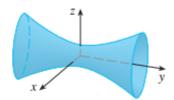
25. $y = 2x^2 + z^2$ **26.** $y^2 = x^2 + 2z^2$
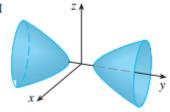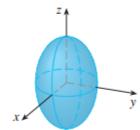
27. $x^2 + 2z^2 = 1$ **28.** $y = x^2 - z^2$

I

II

III

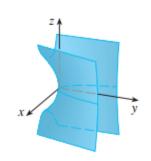IV

V

VI

VII

VIII