

**Example 1.** Plot the points  $P(0, 0, 2)$ ,  $Q(1, 2, 0)$ , and  $R(-1, 2, -3)$ .

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**Example 2.** Describe the set of points  $(x, y, z)$  in space satisfying the following:

a.  $y = 3$

b.  $z = 5$

c.  $y = 3, z = 5$

d.  $0 \leq z \leq 2$

e.  $0 \leq x \leq 1, 0 \leq y \leq 1, z = 1$

f.  $y \geq x^2, z \geq 0$

g.  $x^2 + z^2 = 4, y = 5$

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**Example 3.** Find the center and radius of the sphere

$$x^2 + y^2 + z^2 - 2x + 4y - 8z - 43 = 0.$$

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