

# Classroom Voting Questions: Multivariable Calculus

## 12.2 Graphs of Functions of Two Variables

1. What does a graph of the function  $f(x, y) = x$  look like?
  - (a) A line in the  $xy$  plane
  - (b) A line in three dimensions
  - (c) A horizontal plane
  - (d) A tilted plane
  
2. Let  $h(x, t) = 3 + 3 \sin\left(\frac{\pi}{10}x\right) \cos(2\pi t)$  be the distance above the ground (in feet) of a jump rope  $x$  feet from one end and after  $t$  seconds. The two people turning the rope stand 10 feet apart. Then  $h(x, 1/4)$  is
  - (a) Concave up
  - (b) Concave down
  - (c) Flat
  - (d) Changes concavity in the middle
  
3. The object in 3-space described by  $x = 2$  is
  - (a) A point
  - (b) A line
  - (c) A plane
  - (d) Undefined
  
4. The set of points whose distance from the  $z$ -axis equals the distance from the  $xy$ -plane describes a
  - (a) Plane
  - (b) Cylinder
  - (c) Sphere
  - (d) Cone

- (e) Double cone (two cones joined at their vertices)
5. The graph of  $f(x, y) = 2^{-x^2-y^2}$  will look most like
- (a) a bowl opening up, but more shallow than  $x^2 + y^2$
  - (b) a bowl opening up, but more steep than  $x^2 + y^2$
  - (c) a bowl opening down
  - (d) a small hill in a large plane
6. The cross sections of  $g(x, y) = \sin(x) + y + 1$  with  $x$  fixed are
- (a) lines
  - (b) parabolas
  - (c) sinusoidal curves
  - (d) none of the above
7. The graph of the equation  $f(x, y) = 2$  is a plane parallel to the  $xz$ -plane.
- (a) True, and I am very confident
  - (b) True, but I am not very confident
  - (c) False, but I am not very confident
  - (d) False, and I am very confident
8. The cross section of the function  $f(x, y) = x + y^2$  for  $y = 1$  is a line.
- (a) True, and I am very confident
  - (b) True, but I am not very confident
  - (c) False, but I am not very confident
  - (d) False, and I am very confident
9. The graphs of  $f(x, y) = x^2 + y^2$  and  $g(x, y) = 1 - x^2 - y^2$  intersect in a circle.
- (a) True, and I am very confident
  - (b) True, but I am not very confident
  - (c) False, but I am not very confident
  - (d) False, and I am very confident

10. The equation  $Ax + By + Cz + D = 0$  represents a line in space.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

11. In three space,  $x^2 + y^2 = 1$  represents

- (a) a circle
- (b) a cylinder
- (c) a sphere