

## MATH 1325

### Chapter 14.1: Functions Of Several Variables

#### FUNCTION OF TWO VARIABLES

DOMAIN : INPUT  $(x, y)$

RANGE : OUTPUT  $(z)$

$$z = 2x + 3y$$

#### MULTIVARIATE FUNCTION

$$\text{VOLUME OF A CONE: } V(r, h) = \frac{1}{3}\pi r^2 h$$

$$\text{FUTURE VALUE: } A(P, i, N) = P(1+i)^N$$

$$f(x, y) = 4x^2 + 2xy + \frac{9}{y}$$

FIND  $f(-1, 3)$ .

FIND THE DOMAIN OF  $f(x, y)$ .

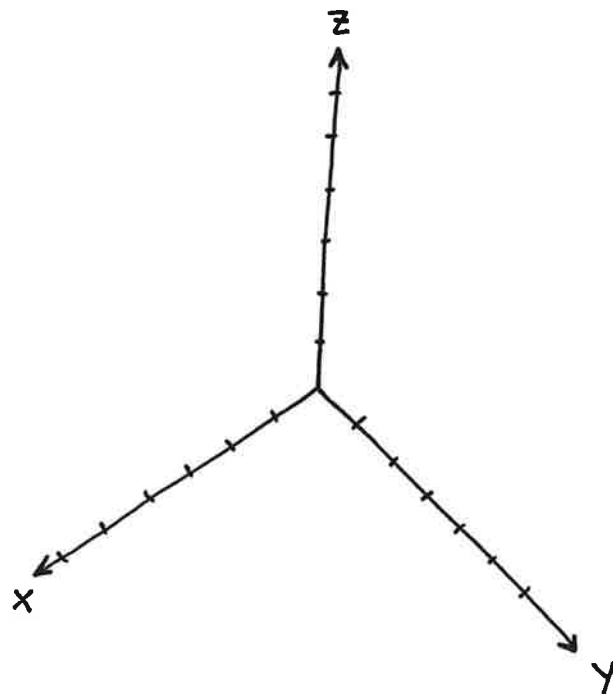
A SOCCER GOALKEEPER'S SAVE PERCENTAGE IS THE NUMBER OF GOALS SAVED DIVIDED BY THE SUM OF GOALS SAVED AND GOALS ALLOWED.

FIND  $f(s, a)$  WHEN  
 $s$  IS GOALS SAVED AND  
 $a$  IS GOALS ALLOWED.

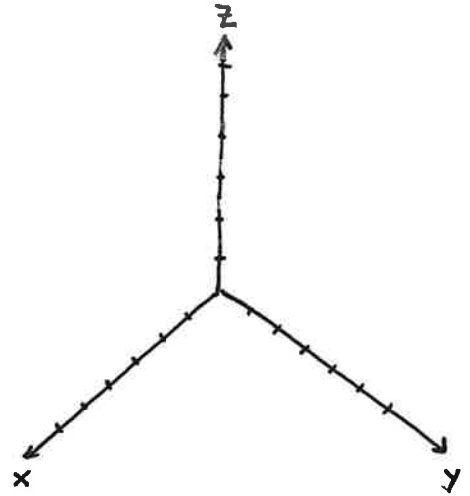
A GOALKEEPER ALLOWED  
21 GOALS AND SAVED 53 GOALS.  
FIND THE SAVE PERCENTAGE.

PLANE EQUATION:  $ax + by + cz = d$

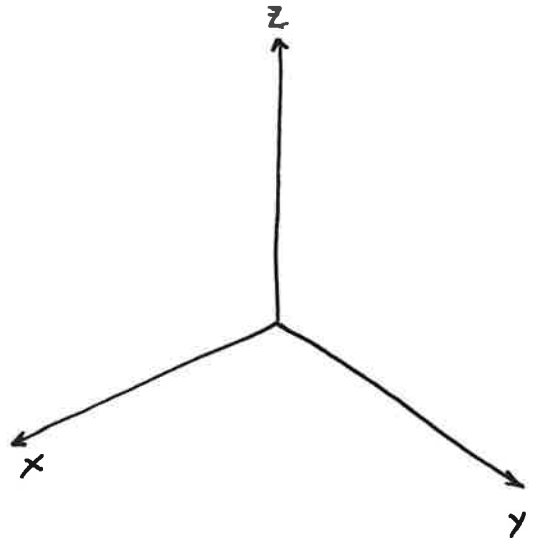
GRAPH  $2x + y + z = 6$



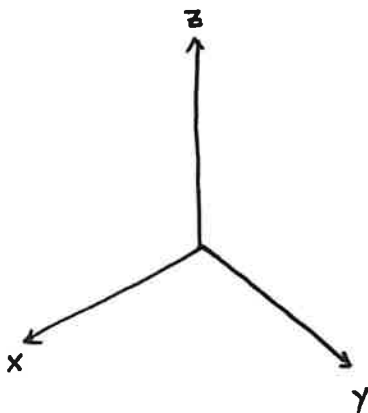
GRAPH  $x + z = 6$ .



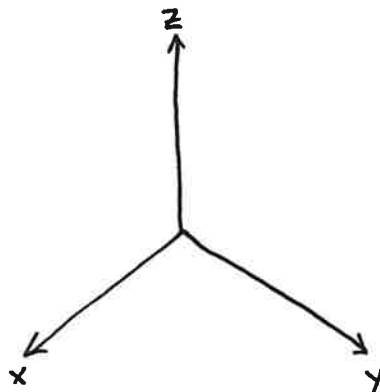
GRAPH  $x = 0$ ,  $y = 0$ , AND  $z = 0$ .



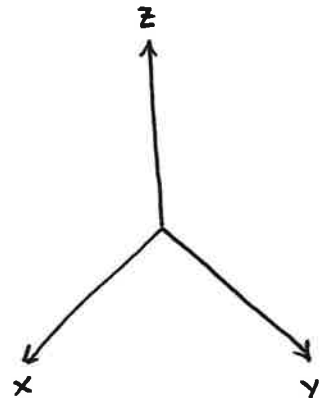
GRAPH  $x = 3$ .



GRAPH  $y = 4$ .



GRAPH  $z = 1$ .



$z = f(x, y)$  IS A SURFACE IN 3-DIMENSIONAL SPACE.

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

FIND THE LEVEL CURVE AT A PRODUCTION OF 100 ITEMS  
FOR THE PRODUCTION FUNCTION  $Z = X^{\frac{2}{3}} Y^{\frac{1}{3}}$ .

PARABOLOID

$$Z = X^2 + Y^2$$

ELLIPSOID

$$\frac{X^2}{a^2} + \frac{Y^2}{b^2} + \frac{Z^2}{c^2} = 1$$

HYPERBOLOID OF 2 SHEETS

$$-X^2 - Y^2 + Z^2 = 1$$

HYPERBOLIC PARABOLOID

$$X^2 - Y^2 = Z$$