

# 微積分A下(統計系)預習測驗 #14

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預習第16章第8節(pp. 1069-1072), 然後回答下列問題

## 1. Spherical Coordinates :

- (a) Read the definition (page 877) of the spherical coordinates  $(\rho, \theta, \phi)$  of a point in space and write down the equations to convert from spherical to rectangular coordinates

$$x = \boxed{\phantom{000000}}, \quad y = \boxed{\phantom{000000}}, \quad z = \boxed{\phantom{000000}}$$

- (b) Let  $E = \{(\rho, \theta, \phi) | a \leq \rho \leq b, \quad \alpha \leq \theta \leq \beta, \quad c \leq \phi \leq d\}$ . Write down the formula for triple integration in spherical coordinates. (bottom of page 1070)

$$\iiint_E f(x, y, z) dV =$$

## 2. Solids in space :

- (a) Draw the solid that lies within the cylinder  $x^2 + y^2 = 1$ , below the plane  $z = 4$ , and above the paraboloid  $z = 1 - x^2 - y^2$ . (top of page 1070)

- (b) Draw the solid that lies above the cone  $z = \sqrt{x^2 + y^2}$  and below the sphere  $x^2 + y^2 + z^2 = z$ . (p.1072)

- (c) Draw the solid bounded above the sphere  $x^2 + y^2 + z^2 = 4$  and below by the paraboloid  $4z = 4 - x^2 - y^2$ .