During the past decade the availability and usage of wireless Internet services has increased manyfold. The industry has developed a number of pricing proposals for such services. Marketing data have indicated that subscribers of wireless Internet services have tended to desire flat rate fee structures as compared with rates based totally on usage.
### 71. Spheres
The volume \( V \) of a sphere of radius \( r \) is \( V = \frac{4}{3} \pi r^3 \); the surface area \( S \) of this sphere is \( S = 4\pi r^2 \). Express the volume \( V \) as a function of the surface area \( S \). If the surface area doubles, how does the volume change?

### 72. Constructing a Closed Box
A closed box with a square base is required to have a volume of 10 cubic feet.

(a) Express the amount \( A \) of material used to make such a box as a function of the length \( x \) of a side of the square base.

(b) How much material is required for a base 1 foot by 1 foot?
(c) How much material is required for a base 2 feet by 2 feet?

(d) Graph \( A = A(x) \). For what value of \( x \) is \( A \) smallest?

### Project at Motorola

During the past decade the availability and usage of wireless Internet services have increased. The industry has developed a number of pricing proposals for such services. Marketing data have indicated that subscribers of wireless Internet services have tended to desire flat fee rate structures as compared with rates based totally on usage. The Computer Resource Department of Indigo Media (hypothetical) has entered into a contractual agreement for wireless Internet services. As a part of the contractual agreement, employees are able to sign up for their own wireless services. Three pricing options are available:

<table>
<thead>
<tr>
<th>Plan</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver Plan</td>
<td>$20/month for up to 200 K-bytes of service plus $0.16 for each additional K-byte of service</td>
</tr>
<tr>
<td>Gold Plan</td>
<td>$50/month for up to 1000 K-bytes of service plus $0.08 for each additional K-byte of service</td>
</tr>
<tr>
<td>Platinum Plan</td>
<td>$100/month for up to 3000 K-bytes of service plus $0.04 for each additional K-byte of service</td>
</tr>
</tbody>
</table>

You have been requested to write a report that answers the following questions in order to aid employees in choosing the appropriate pricing plan.

(a) If \( C \) is the monthly charge for \( x \) K-bytes of service, express \( C \) as a function of \( x \) for each of the three plans.

(b) Graph each of the three functions found in part (a).

(c) For how many K-bytes of service is the Silver Plan the best pricing option? When is the Gold Plan best? When is the Platinum Plan best? Explain your reasoning.

(d) Write a report that summarizes your findings.