Geosynchronous Orbit (GEO)
(inclination = 0°, period = 24 hours)

r = 42,241 km.
   = 26,253 miles

Since satellite at point B takes 24 hours to circle the Earth, and point A on the equator also takes 24 hrs to make a complete circle as Earth rotates, satellite is always directly above point A on the ground.

Points C and D can both send and receive radio and television signals to and from the satellite at B, but C and D are too far apart to communicate with each other directly. They can use the satellite as a relay for the signals to each other. Note that B does not move relative to C or D, either.

Problem: point E (near North Pole) cannot communicate with satellite (because it is too far South).

signal from E cannot reach B (Earth is in the way)
Molniya orbit

(inclination = 63°, period = 12 hrs.)

Satellite moves very fast when near perigee, but very slowly when near apogee.

Of the 12 hours to make one complete trip around the orbit, the satellite will spend most of that time in the Northern hemisphere (i.e. near apogee).

Because of inclination, point E can communicate with satellites and relay signals to point C, now.

Useful to USSR, with much land at high latitudes.
Satellite on orbit #1 needs to use rockets to get to orbit #2. How?

This way takes too much propellant.

So does this.
Instead, let gravity work for you. Use a Hohmann transfer.

Apply a small push with rockets at point A to achieve conditions necessary for an elliptical orbit. When satellite reaches point B (which lies on orbit #2), apply another push with the rockets to achieve necessary speed for the desired circular orbit (#2).

The elliptical transfer orbit is called a Hohmann transfer (named for Walter Hohmann, who first suggested its use in 1925, long before any satellites were put in space).
Hohmann transfer between planets

Use Hohmann transfer for Mars mission as follows:

Leave Earth and let Sun's gravity create an elliptical (Hohmann) transfer path that carries spacecraft to Mars' orbit (#2). Time the departure from Earth so that Mars will be on opposite side of Sun when the spacecraft arrives!

Gravity-assist maneuver changes direction of spacecraft without using any propellant.

Then, either use rockets to create necessary conditions for circular orbit around Mars, or else, let Mars' gravity re-direct the spacecraft along a new path (perhaps toward Jupiter).