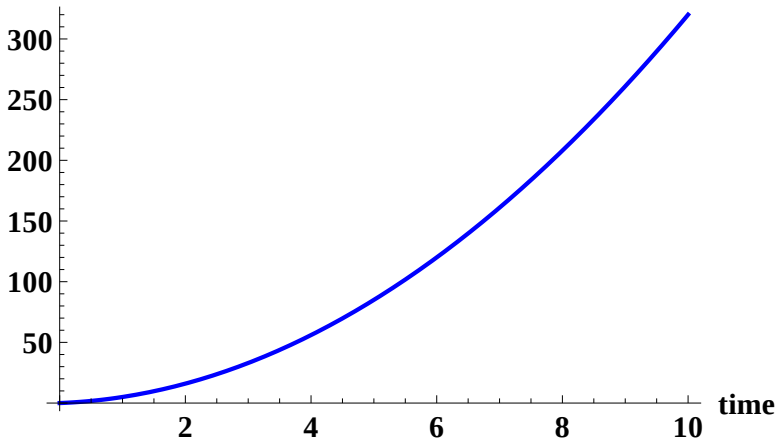
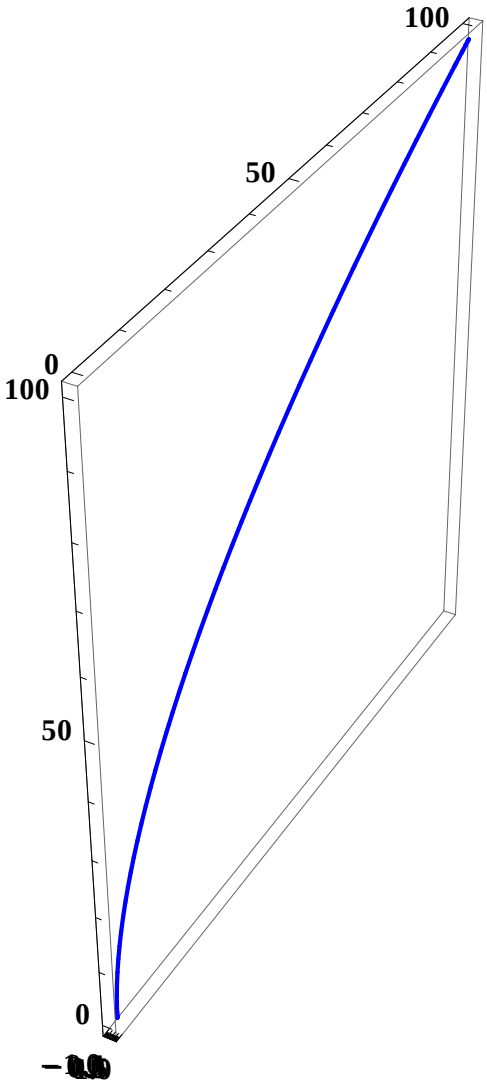
```
(* Experiment-1,case: when velocity is parallel
  to uniform electric field and there is no magnetic filed:
   Electric field is along z direction and velocity is also along z direction *)

Clear All; q =.; m =.; El =.; u =.; t =.; x =.; y =.; z =.; r = q/m;

(* t is the time, q is the charge, m is mass,
El is the magnitude of electric field,
u is magnitude of the velocity,  and r is ratio of q and m *)

ClearAll; q = 2; m = 1; El = 3; t =.; u = 2; r = q/m;

Plot[{u t + 1/2 r El t^2}, {t, 0, 10},
 PlotStyle → {Thick, Blue}, AxesLabel → {time, position},
 LabelStyle → Directive[Black, Bold], AxesStyle → Directive[Black, 14]]
```



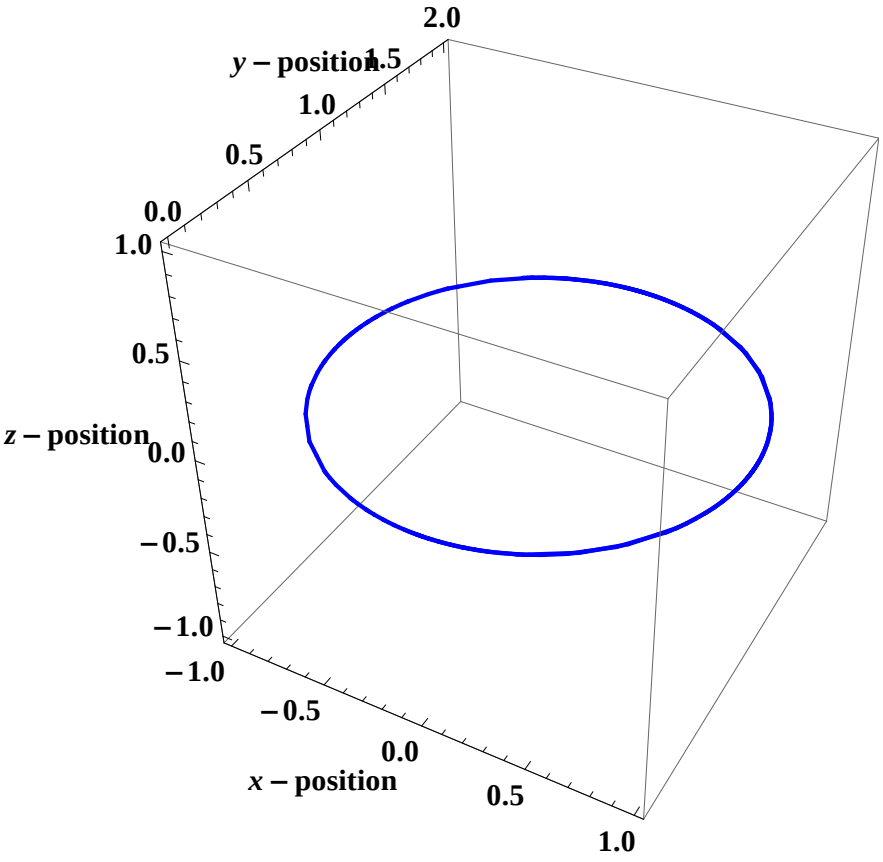
```
(* Experiment-1,
case: when initial velocity is perpendicular to uniform electric field and there
  is no magnetic filed: velocity along z and electric field along y direction
 *)
```

```
ClearAll; q = 1; m = 1; t =.; u = 5; El = 0.5; x =.; y =.; z =.; a = q/m;
ParametricPlot3D[{0, 1/2 a El t^2, u t}, {t, 0, 20}, PlotStyle → {Thick, Blue},
 LabelStyle → Directive[Black, Bold], AxesStyle → Directive[Black, 14]]
```



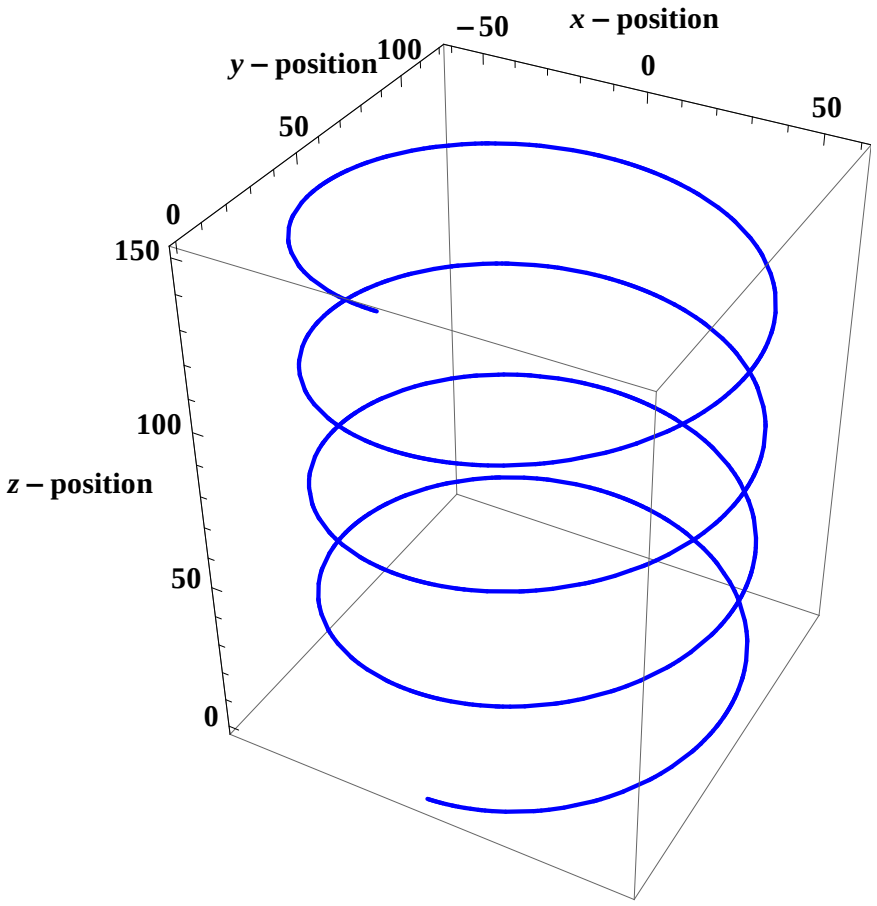

```
(* Experiment-2,
case: when initial velocity is perpendicular to uniform magnetic field and there
  is no Electric: velocity is in xy plan and magnetic field z direction
*)
ClearAll; Bl =.; u =.; t =.; q =.; m =.; r = q/m; w =.;
```

```
ClearAll; Bl = 1; u = 2; t =.; q = 2; m = 1; w = q Bl/m; (* Bl is the magnetic filed,
u is the magnitude of velocity, w is the angular frequency*)
ParametricPlot3D[{u/w Sin[w t], u/w (1 - Cos[w t]), 0}, {t, 0, 5},
 PlotStyle → {Thick, Blue}, AxesLabel → {x - position, y - position, z - position},
 LabelStyle → Directive[Black, Bold], AxesStyle → Directive[Black, 14]]
```



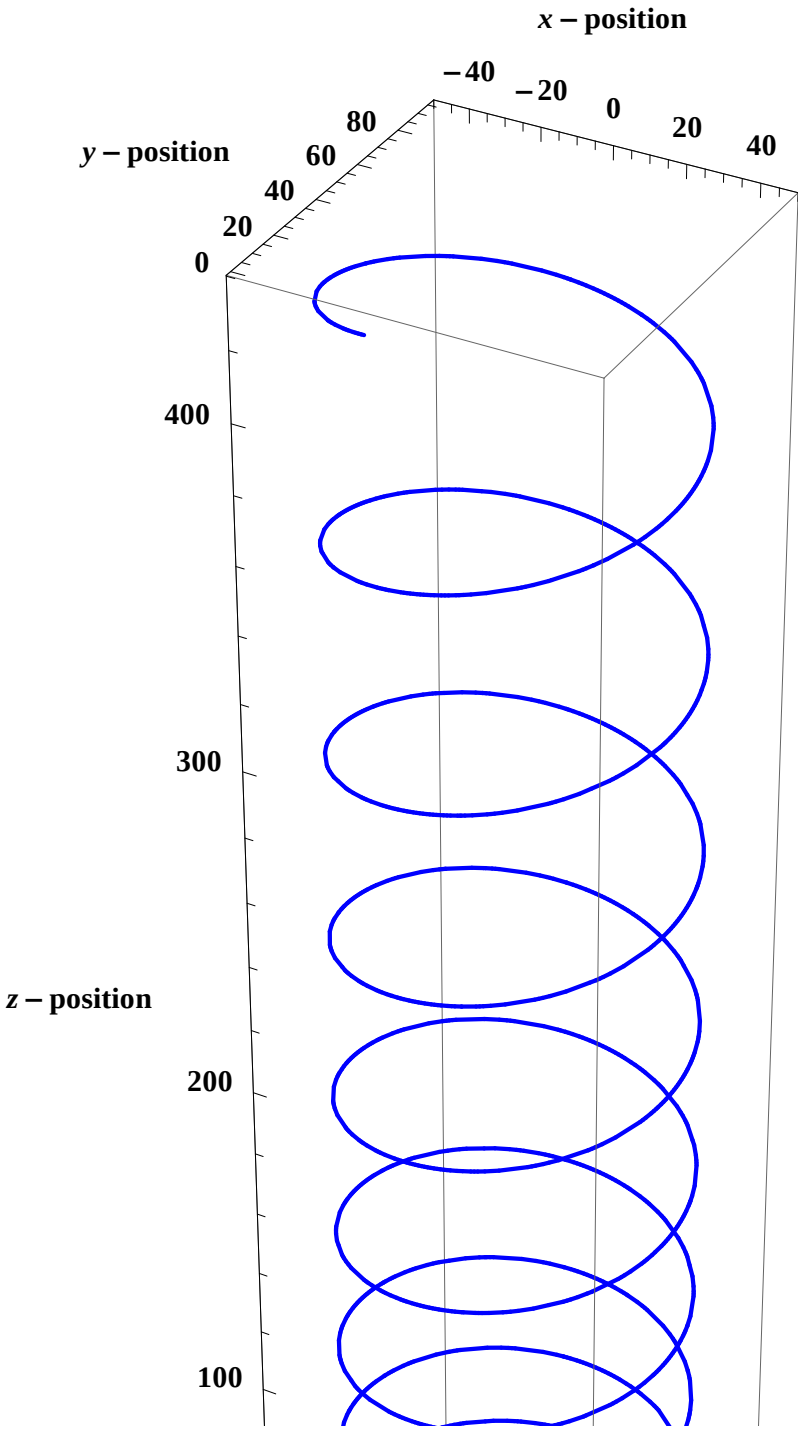
```
(* Experiment-2,case: when initial velocity is making
  arbitrary angle wrt to uniform magnetic field and there is no
  Electric: there will be z component of velocity (uz) and magnitude of
    velocity in xy plan (u) will be same and magnetic field z direction
*)
ClearAll; Bl =.; u =.; t =.; q =.; m =.; uz =.; r =.; w =.;
```

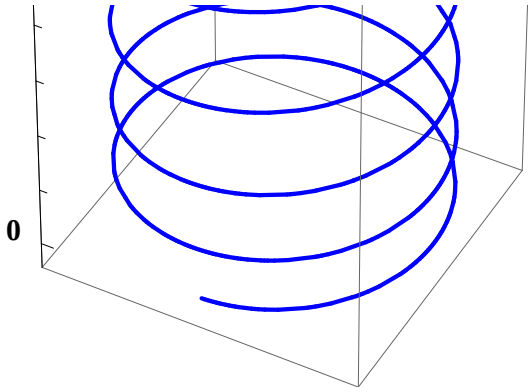
```
Clear All; q = 1; t = .; u = 10; m = 12; Bl = 2; uz = 1; r = q/m;
ParametricPlot3D[{u/(r Bl) Sin[r Bl t], u/(r Bl) (1 - Cos[r Bl t]), uz t}, {t, 0, 150},
 PlotStyle → {Thick, Blue}, AxesLabel → {x - position, y - position, z - position},
 LabelStyle → Directive[Black, Bold], AxesStyle → Directive[Black, 14]]
```




```
(* Experiment-3,
case: when initial velocity is making arbitrary angle wrt to uniform magnetic
  field and there is uniform Electric; both field are parallel to
 eachother : there will be z component of velocity (uz) and magnitude of
   velocity in xy plan (u) will be same and magnetic field z direction
*)
ClearAll; Bl = .; u = .; t = .; q = .; m = .; uz = .; r = .; El = .; w = .;
```

```
Clear All; q = 1; t = .; u = 20; m = 12; Bl = 5; uz = 1; r = q/m; El = 0.3;

ParametricPlot3D[{u/(r Bl) Sin[r Bl t], u/(r Bl) (1 - Cos[r Bl t]), uz t + 1/2 r El t^2},
 {t, 0, 150}, PlotStyle → {Thick, Blue},
 AxesLabel → {x - position, y - position, z - position},
 LabelStyle → Directive[Black, Bold], AxesStyle → Directive[Black, 14]]
```

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