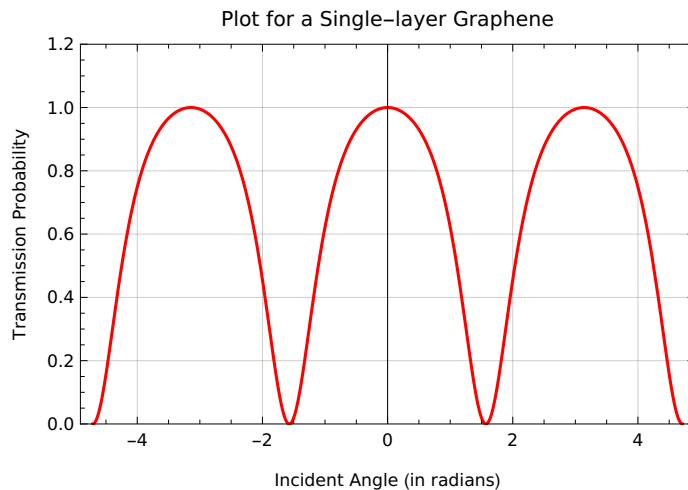```
(*Rajdeep Tah, 1911124, Mesoscopic HW-7*)

hbar = 1.0545718 * 10 ^ (-34); m = 9.10938356 * 10 ^ (-31);
eV = 1.60217662 * 10 ^ (-19); a = 0.246 * 10 ^ (-9);

T[E_, Theta_] :=
 Module[{kx, ky, k, V0 = 0.25, w = 10 ^ (-9)},
  kx = Sqrt[(E + V0) * 2 * m] / hbar * Sin[Theta];
  ky = Sqrt[(E + V0) * 2 * m] / hbar * Cos[Theta];
  k = Sqrt[kx ^ 2 + ky ^ 2];
  4 * kx ^ 2 * ky ^ 2 / (4 * kx ^ 2 * ky ^ 2 + (k ^ 2 - ky ^ 2) ^ 2 * Sin[k * a * w] ^ 2)]

Plot[T[0.3 * eV, Theta], {Theta, -3 * Pi / 2, 3 * Pi / 2}, PlotStyle → Red,
 Frame → True,
 FrameLabel → {"Incident Angle (in radians)", "Transmission Probability"},
 PlotRange → {All, {0, 1.2}},
 PlotLabel → "Plot for a Single-layer Graphene",
 ImageSize → Medium,
 GridLines → Automatic]
```

Out[305]=

In[312]:=

```
hbar = 1.0545718*10^(-34); m = 9.10938356*10^(-31);
eV = 1.60217662*10^(-19); a = 0.246*10^(-9);
T[E_, Theta_, Phi_] :=
 Module[{kx, ky, k, V0 = 0.2, w = 10^(-9), alpha},
  alpha = ArcTan[Cos[Phi], Sin[Phi]/Sqrt[2]];
  kx = Sqrt[(E + V0)*2*m]/hbar*(Cos[Theta]*Cos[alpha] + Sin[Theta]*Sin[alpha]);
  ky = Sqrt[(E + V0)*2*m]/hbar*(Cos[Theta]*Sin[alpha] - Sin[Theta]*Cos[alpha]);
  k = Sqrt[kx^2 + ky^2];
  4*kx^2*ky^2/(4*kx^2*ky^2 + (k^2 - ky^2)^2*Sin[k*a*w]^2)]

Plot3D[T[0.1*eV, Theta, Phi], {Theta, 0, Pi/2}, {Phi, 0, 2*Pi},
 AxesLabel -> {"Incident Angle (in radians)",
   "Chirality Angle (in radians)", "Transmission Probability"},
 PlotLabel ->
  "Plot for variation of Transmission Probability for a Single-layer Graphene",
 ImageSize -> Large, ColorFunction -> "TemperatureMap"]
```

Out[314]=

Plot for variation of Transmission Probability for a Single-layer Graphene