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## Question 1

```
Clear["Global`*"]

mandelbrot[cx_, cy_, lim_] :=
Module[{z = 0, ct = 0}, While[Abs[z] < 2.0 && ct <= lim, z = z^2 + cx + I cy;
++ct];
-ct];

mandelbrotC = Compile[{cx, cy, lim},
Module[{z = 0. + I 0., ct = 0}, While[Abs[z] < 2.0 && ct <= lim, z = z^2 + cx + I cy;
++ct];
-ct]];

DensityPlot[mandelbrot[x, y, 100], {x, -2, 0.6}, {y, -1.3, 1.3}, PlotPoints → 200,
Mesh → False, ColorFunction → (Hue[0.65 #1^0.6] &), FrameLabel → {"cx", "cy"}]
```

