**Mandelbrot for the Masses Iteration Formula**: $z \_{n+1}=\left(z \_{n}\right)^{2}+c$

**Try**:$ 1=c=z \_{1}$$c=-1$ $c=-2$ **Calculator tips for generating the sequence:**

|  |  |  |  |
| --- | --- | --- | --- |
| $$z \_{2}=\left(z \_{1}\right)^{2}+c$$$$2=\left(1\right)^{2}+1$$ | $$0=\left(-1\right)^{2}+(-1)$$ |  | **Note** 2nd MODE (QUIT) will getyou back to the Home ScreenAnything in a BOX is a key stroke.(Use the Arrow Keys) * **For practice, type in -2**

 (-) 2 STO> ALPHA PRGM (C) ENTER (This is z1) 2nd (-) (ANS) x2 + ALPHA PRGM (C) ENTER (This is z2)   ENTER (This is z3)ENTER (This is z4) … etc.  |
| $$z \_{3}=\left(z \_{2}\right)^{2}+c$$$$5=\left(2\right)^{2}+1$$ | $$-1=\left(0\right)^{2}+(-1)$$ |  |
| $$z \_{4}=\left(z \_{3}\right)^{2}+c$$$$26=\left(5\right)^{2}+1$$ | $$0=\left(-1\right)^{2}+(-1)$$ |  |
| $$z \_{5}=\left(z \_{4}\right)^{2}+c$$$$677=\left(26\right)^{2}+1$$ | $$-1=\left(0\right)^{2}+(-1)$$ |  |
| $$z \_{6}=\left(z \_{5}\right)^{2}+c$$$$\left(677\right)^{2}+1$$$$=458,330$$ | $$0=\left(-1\right)^{2}+(-1)$$ |  |
| $$\left|z\right|=\left|a+bi\right|$$$ =\sqrt{a^{2}+b^{2}}$ $$\left|z \_{6}\right|=458,330$$ | $$\left|z \_{5}\right|=1$$$$\left|z \_{6}\right|=0$$ | $$\left|z \_{6}\right|=$$ |

IF you’re feeling adventurous, try the next few suggestions and use your calculator to find the values:

**Try:** $c=0.2$ $c=0.3$$c=i$$c=\frac{1}{2}i$ $c=0.2+0.2i$ **,** $c=0.5+0.5i$ **,** $c=-2.1$

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| $$z \_{2}=\left(z \_{1}\right)^{2}+c$$ |  |  |  |  |  |  |
| $$z \_{3}=\left(z \_{2}\right)^{2}+c$$ |  |  |  |  |  |  |
| $$z \_{4}=\left(z \_{3}\right)^{2}+c$$ |  |  |  |  |  |  |
| $$z \_{5}=\left(z \_{4}\right)^{2}+c$$ |  |  |  |  |  |  |
| $$z \_{6}=\left(z \_{5}\right)^{2}+c$$ |  |  |  |  |  |  |
| $$\left|z\right|=\left|a+bi\right|$$$ =\sqrt{a^{2}+b^{2}}$ $$\left|z \_{6}\right|=$$ | $$\left|z \_{6}\right|=$$ | $$\left|z \_{6}\right|=$$ | $$\left|z \_{6}\right|=$$ | $$\left|z \_{6}\right|=$$ | $$\left|z \_{6}\right|=$$ | $$\left|z \_{6}\right|=$$ |