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#Deven Singh
# Assignment 10
with(LinearAlgebra) :
#2i
M := Matrix([[-16/3, 5], [-7, 13/2]]);
```

$$M := \begin{bmatrix} -\frac{16}{3} & 5 \\ -7 & \frac{13}{2} \end{bmatrix} \quad (1)$$

```
P := Matrix([[0.3], [0.6]]);
```

$$P := \begin{bmatrix} 0.3 \\ 0.6 \end{bmatrix} \quad (2)$$

```
M^1000 . P;
```

$$\begin{bmatrix} 6.07858099239568 \times 10^{-176} \\ 7.29429719087481 \times 10^{-176} \end{bmatrix} \quad (3)$$

```
#After 1000 transformations, (x,y) ~ (0,0). Therefore, (0,0) is a stable fixed point.
#2ii
N := Matrix([[92/3, -25], [35, -57/2]]);
```

$$N := \begin{bmatrix} \frac{92}{3} & -25 \\ 35 & -\frac{57}{2} \end{bmatrix} \quad (4)$$

```
N^1000 . P;
```

$$\begin{bmatrix} -8.88365229772445 \times 10^{176} \\ -1.03642610140119 \times 10^{177} \end{bmatrix} \quad (5)$$

```
# After 1000 transformations, (x,y) diverges to negative infinity. Therefore, (0,0) is an unstable
    fixed point
#2iii
X := Matrix([[-177/4, 75/2], [-105/2, 89/2]]);
```

$$X := \begin{bmatrix} -\frac{177}{4} & \frac{75}{2} \\ -\frac{105}{2} & \frac{89}{2} \end{bmatrix} \quad (6)$$

```
X^1000 . P;
```

$$\begin{bmatrix} 8.63623905093621 \times 10^{-125} \\ 1.03634868611234 \times 10^{-124} \end{bmatrix} \quad \textbf{(7)}$$

```
> # After 1000 transformations, (x,y) ~ (0,). Therefore, (0,0) is a stable fixed point.
>
```