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Question: 3.26 A fractal is a curve or geometric figure, each part of which has the same statistical charac...

3.26 A *fractal* is a curve or geometric figure, each part of which has the same statistical character as the whole. Fractals are useful in modeling structures (such as eroded coastlines or snowflakes) in which similar patterns recur at progressively smaller scales, and in describing partly random or chaotic phenomena such as crystal growth, fluid turbulence, and galaxy formation. Devaney (1990) has written a nice little book that includes a simple algorithm to create an interesting fractal pattern. Here is a step-by-step description of this algorithm:

Step 1: Assign value to m and n and set hold on.
Step 2: Start a for loop to iterate over ii = 1:100000
Step 3: Compute a random number, q = 3*rand(1)
Step 4: If the value of q is less than 1 go to Step 5. Otherwise go to Step 6.
Step 5: Compute new values for m = m/2 and n = n/2 and then go to Step 9.
Step 6: If the value of q is less than 2 go to Step 7. Otherwise go to Step 8.
Step 7: Compute new values for m = m/2 and n = (300 + n)/2, and then go to Step 9.
Step 8: Compute new values for m = (300 + m)/2 and n =

(300 + n)/2.

Step 9: If i is less than 1000 then go to Step 10. Otherwise, go to Step 11.

Step 10: Plot a point at the coordinate,(m,n).

Step 11: Terminate ii loop.

Step 12: Set hold off.

Develop a MATLAB script for this algorithm using for and if structures. Run it for the following two cases **(a)** m = 2 and n = 1 and **(b)** m = 100 and n = 200.

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Expert Answer

captain
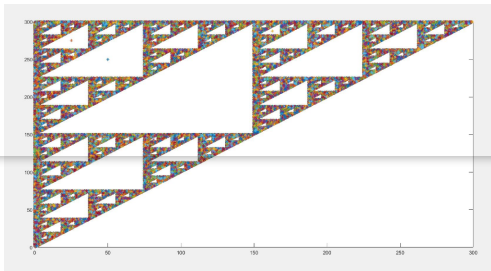answered this

ANSWER:

MATLAB CODE FOR THE GIVEN QUESTION IS GIVEN BY

Matlab code:

```
% Step 1
m = 100;
n = 200;
hold on
% Step 2
for i = 1:100000
    q = 3*rand(1); % Step 3
    if q < 1 % Step 4
       % Step 5
       m = m/2;
       n = n/2;
    elseif q < 2 % Step 6
       % Step 7
       m = m/2;
       n = (300+n)/2;
    else
       % Step 8
       m = (300+m)/2;
       n = (300+n)/2;
    end

    plot(m,n,'.b') % Step 9 & 10

end % Step 11
hold off % Step 12
```

THE PLOTS ARE GIVEN BELOW:

0 Comments

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A fractal is a curve or geometric figure, each part of which has the same statistical character as the whole. Fractals are useful in modeling structures (such as eroded coastlines or snowflakes) in which similar patterns recur at progressively smaller scales and in describing partly random or chaotic phenomena such as crystal growth, fluid turbulence, and galaxy formation. Devaney...

See answer

Required information A fractal is a curve or geometric figure, each part of which has the same statistical character as the whole. Fractals are useful in modeling structures (such as eroded coastlines or snowflakes) in which similar patterns recur at progressively smaller scales and in describing partly random or chaotic phenomena such as crystal growth, fluid turbulence, and galaxy...

See answer

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The magnitude of the absolute velocity of point A on the automobile tire is 16 m/sec when A is in…

The magnitude of the absolute velocity of point *A* on the automobile tire is 16 m/sec when *A* is in the position shown. What are the corresponding velocity v_0 of the car and the angular velocity ω of the wheel? (The wheel rolls without slipping.)

v of 0 = [   ] m/sec   ✗

ω = [   ] rad/sec   ✗

See answer

A 4 N collar slides without friction along a vertical rod as shown. The spring attached to the collar h…

2. A 4 N collar slides without friction along a vertical rod as shown. The spring attached to the collar has an undeformed length of 100 mm and a spring constant of 0.6 N/mm. if the collar is released from rest in position 1, determine its velocity after it has moved 150 mm to position 2.

|← 200 mm →|
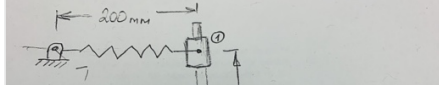
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