
```

output = '##p: 7\n##id: yw\n';
% Q1
x = zeros(1, 6);
x(1) = -7;
for t = 2:6
    x(t) = x(t - 1) - polyval([3, -5, 3, -9, 7, -9], x(t - 1)) / polyval([15,
    -20, 9, -18, 7], x(t - 1));
end
x(1:6)
output = [output '##1: ' mat2str(ans) '\n'];
% Q2
x = zeros(1, 111);
x(1) = 2;
for t = 2:111
    if polyval([15, -20, 9, -18, 7], x(t - 1)) == 0
        x(t) = x(t - 1);
    else
        x(t) = x(t - 1) - polyval([3, -5, 3, -9, 7, -9], x(t - 1)) /
polyval([15, -20, 9, -18, 7], x(t - 1));
    end
end
x(1:111)
output = [output '##2: ' mat2str(ans) '\n'];
% Q3
x = zeros(1, 1000);
x(1) = -8;
f = polyval([3, -5, 3, -9, 7, -9], x(1));
df = polyval([15, -20, 9, -18, 7], x(1));
t = 2;
while abs(f) >= 0.005 && abs(f) <= 10^7 && df ~= 0
    x(t) = x(t - 1) - f / df;
    f = polyval([3, -5, 3, -9, 7, -9], x(t));
    df = polyval([15, -20, 9, -18, 7], x(t));
    t = t + 1;
end
x(1:t-1)
output = [output '##3: ' mat2str(ans) '\n'];
% Q4
x = zeros(1, 7);
x(1:2) = [-7 -6];
f = polyval([3, -5, 3, -9, 7, -9], x(2:-1:1));
for t = 3:7
    x(t) = (x(t - 2) * f(1) - x(t - 1) * f(2)) / (f(1) - f(2));
    f(2) = f(1);
    f(1) = polyval([3, -5, 3, -9, 7, -9], x(t));
end
x(1:7)
output = [output '##4: ' mat2str(ans) '\n'];
% Q5
x = zeros(1, 112);
x(1:2) = [2 3];
f = polyval([3, -5, 3, -9, 7, -9], x(2:-1:1));

```

```

for t = 3:112
    if f(1) == f(2)
        x(t) = x(t - 1);
    else
        x(t) = (x(t - 2) * f(1) - x(t - 1) * f(2)) / (f(1) - f(2));
    end
    f(2) = f(1);
    f(1) = polyval([3, -5, 3, -9, 7, -9], x(t));
end
x(1:112)
output = [output '##5: ' mat2str(ans) '\n'];
% Q6
x = zeros(1, 1000);
x(1:2) = [-8 -7];
f = polyval([3, -5, 3, -9, 7, -9], x(2:-1:1));
t = 3;
while abs(f(1)) >= 0.005 && abs(f(1)) <= 10^7 && f(1) ~= f(2)
    x(t) = (x(t - 2) * f(1) - x(t - 1) * f(2)) / (f(1) - f(2));
    f(2) = f(1);
    f(1) = polyval([3, -5, 3, -9, 7, -9], x(t));
    t = t + 1;
end
x(1:t-1)
output = [output '##6: ' mat2str(ans) '\n'];
% Q7
[-6 11; 0 17 * phi(2.5)]
output = [output '##7: ' mat2str(ans) '\n'];
% Q8
x = -6:17/9:11;
m = x + 17/18;
[x; 0 17/9 * phi(m(1:9))];
output = [output '##8: ' mat2str(ans) '\n'];
% Q9 either same as Q8 or actually random
x = sort(rand(1, 10)) .* 17 - 6;
m = ([0 x] + [x 0]) .* 0.5;
[x; 0 diff(x) .* phi(m(2:10))];
output = [output '##9: ' mat2str(ans) '\n'];
% Q10 and write to file
output = [output '##10: None'];
file = fopen('P7.txt', 'wt');
fprintf(file, output);
fclose(file);
function p = phi(x)
    z = (x - 3) ./ 5;
    p = 1 / (5 * sqrt(2 * pi)) .* exp(-0.5 .* z .* z);
end

```

ans =

```
-7.0000    -5.5281    -4.3470    -3.3961    -2.6253    -1.9909
```

ans =

Columns 1 through 7

2.0000 1.8966 1.8760 1.8753 1.8753 1.8753 1.8753

Columns 8 through 14

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 15 through 21

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 22 through 28

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 29 through 35

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 36 through 42

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 43 through 49

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 50 through 56

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 57 through 63

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 64 through 70

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 71 through 77

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 78 through 84

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 85 through 91

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 92 through 98

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 99 through 105

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 106 through 111

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

ans =

Columns 1 through 7

-8.0000 -6.3294 -4.9903 -3.9146 -3.0465 -2.3392 -1.7507

Columns 8 through 14

-1.2377 -0.7421 -0.1487 0.8818 -0.5285 0.1700 2.1288

Columns 15 through 18

1.9480 1.8832 1.8754 1.8753

ans =

-7.0000 -6.0000 -5.0692 -4.2939 -3.6188 -3.0388 -2.5347

ans =

Columns 1 through 7

2.0000 3.0000 1.9725 1.9516 1.8861 1.8766 1.8753

Columns 8 through 14

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 15 through 21

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 22 through 28

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 29 through 35

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 36 through 42

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 43 through 49

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 50 through 56

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 57 through 63

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 64 through 70

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 71 through 77

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 78 through 84

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 85 through 91

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 92 through 98

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 99 through 105

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

Columns 106 through 112

1.8753 1.8753 1.8753 1.8753 1.8753 1.8753 1.8753

ans =

Columns 1 through 7

-8.0000 -7.0000 -5.8781 -5.0048 -4.2252 -3.5640 -2.9899

Columns 8 through 14

-2.4927 -2.0567 -1.6689 -1.3142 -0.9740 -0.6205 -0.2034

Columns 15 through 21

0.3825 1.7330 9.9597 1.7332 1.7335 1.9234 1.8625

Columns 22 through 23

1.8742 1.8753

ans =

-6.0000 11.0000
0 1.3496

ans =

Columns 1 through 7

-3.9770 -3.2356 -2.1952 -1.3076 -0.2134 2.4722 3.9496
0 0.0247 0.0432 0.0451 0.0658 0.1998 0.1178

Columns 8 through 10

5.1367 5.5549 10.3156
0.0903 0.0299 0.2334

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