
```

% APC524 - Numerical Algorithms
%
% Homework #1
% Problem 6

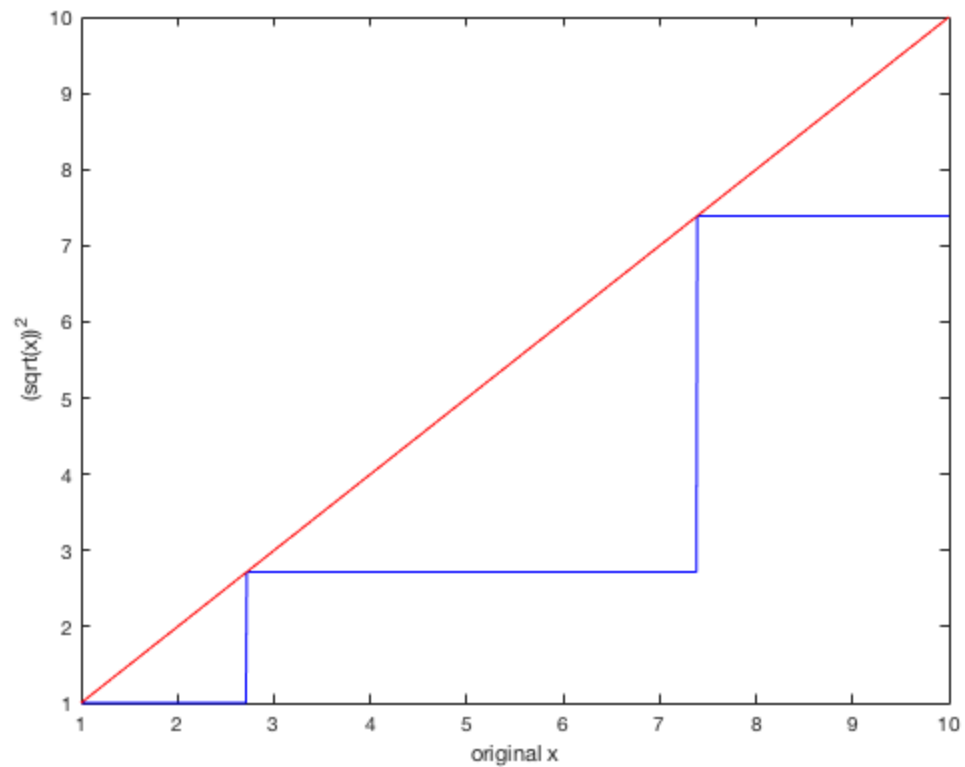
x = linspace(1, 10, 1001);
x_sqr = x;

for i = 1:52
    x_sqr = sqrt(x_sqr);
end

x_sq = x_sqr;
for i = 1:52
    x_sq = x_sq.^2;
end

plot(x, x_sq, 'b', [1,10], [1,10], 'r-')
xlabel('original x')
ylabel('(\sqrt{x})^2')

```



```

x(abs(x-x_sq)<0.01);
% for 49 iterations
% 1, 1.1331, 1.2840, 1.4550, 1.6487, 1.8682, 2.1170, 2.3989, 2.7183,

```

```

% 3.0802, 3.4903, 3.9551, 4.4817, 5.0784, 5.7546, 6.5208, 7.3891,
    8.3729,
% 9.4877 (19)
% for 50 iterations
% 1, 1.2840, 1.6487, 2.117, 2.7183, 3.4903, 4.4817, 5.7546, 7.3891,
    9.4877
% (10)
% for 51 iterations
% values are 1, 1.6487, 2.7183, 4.4817, 7.3891 (5)
% 52 iterations
% values are 1, 2.7183, 7.3891 (3)
% 53 iterations
% values are 1, 7.3891 (2)
% 54 iterations
% values are 1 (1)
unique(x_sq)

% observations: all values left intact are the sqrt of other values
% with each successive iteration, every other intact value is removed
    (1 is
% always preserved)
unique(x_sqr - ones(1, length(x_sqr)))

%plot(x, diff)

ans =

    7.38905598869578    1    2.71828180818247

ans =

    4.44089209850063e-16    0    2.22044604925031e-16

```

Published with MATLAB® R2018a