1.(c) Central differencing of $\frac{1}{x}$

We know that, central difference of any function $f(x)$ is given by $f(x_0) = \frac{f(x_0 + \Delta x) - f(x_0 - \Delta x)}{2\Delta x}$

```
clear ALL;
clc;

syms x h;
fx = 1 / x;
diff_fx = diff(fx);
cdm_fx = (subs(fx, x, x + h) - subs(fx, x, x - h)) / (2 * h);
cdm_to_plot = subs(cdm_fx, h, 0.1);

figure;
hold ON;
fplot(diff_fx, [1 5], 'reds--');
fplot(diff_fx, [1 5], 'blue.-.');
legend("d/dx(1/x)", "CDM(1/x)");
title("Central differencing of 1/x");
xlabel("x \rightarrow");
ylabel("d/dx(1/x) \rightarrow");
hold OFF;
grid ON;
```