$$g''(x) = \frac{1}{2} + \frac{1}{2x^2} > 0$$

$\Rightarrow g'(x)$ - increasing

$$|g'(x)| < \frac{2}{2} - \frac{1}{4 \cdot 2} = 1 - \frac{1}{8} = \frac{7}{8} < 1$$

Thus, this iteration converges

n	p_n	n	p_n
0	1.5	9	1.412709914
1	1.461133723	10	1.412559879
2	1.438924775	11	1.412480459
3	1.426652089	12	1.412438425
4	1.42000142	13	1.412416178
5	1.41643654	14	1.412404405
6	1.414537058	15	1.412398175
7	1.413528195	16	1.412394878
8	1.412993278	17	1.412393133
		18	1.41239221
		19	1.412391721

The following theorem illustrates the impotance of the choice of p_0.

Theorem 2.5. Let $f \in C^2[a,b]$. If p is such that $f(p) = 0$, $f'(p) \neq 0$ then there exists a $\delta > 0$ such that Newton's method generates