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a)  $x$  tarkka arvo 5  $\rightarrow 10^x = 10^5 = 100000$

suht. virhe 1%

$$\rightarrow x_1 = 5,05 \rightarrow 10^x = 10^{5,05} = 112202 \rightarrow \underline{\underline{+12\%}}$$

$$(x_2 = 4,95 \rightarrow 10^x = 10^{4,95} = 89125 \rightarrow -11\%)$$

suht. virhe 10%

$$\rightarrow x_1 = 5,5 \rightarrow 10^x = 10^{5,5} = 316228 \rightarrow \begin{matrix} 3,16\text{-kertainen} \\ 216\% \text{ suurempi} \\ \approx 220\% \end{matrix}$$

b)  $x$  tarkka arvo 50  $\rightarrow 10^x = 10^{50}$

 $x$  suht. virhe 1%

$$x_1 = 50,5 \rightarrow 10^x = 10^{50,5} = 10^{50} \cdot 10^{0,5} = 3,162 \cdot 10^{50} \rightarrow 10^x \text{ 220\% suurempi}$$

suht. virhe 10%

$$x_2 = 55 \rightarrow 10^x = 10^{55} = 10^5 \cdot 10^{50} = 100000 \cdot 10^{50}$$

100000-kertainen  $\Rightarrow$  99999% virhe

156  $(a+b)$ 

$$\frac{\sqrt{a}-\sqrt{b}}{1} = \frac{a-b}{\sqrt{a}+\sqrt{b}}$$

$$\sqrt{99}-\sqrt{98} = \frac{99-98}{\sqrt{99}+\sqrt{98}} \approx \frac{1}{9,9+9,9} = \frac{1}{19,8} \approx 0,050505$$

$\approx 9,9$   $\approx 0,051$

$$10-\sqrt{99} = \sqrt{100}-\sqrt{99} = \frac{100-99}{10+\sqrt{99}} \approx \frac{1}{19,9} = 0,050251$$

$\approx 0,050$

s.87  
161  
162  
166  
168  
172-174