Differentials

42)

$\tan\theta = \frac{h}{50}$

$h = 50\tan\theta$

$dh = 50\sec^2\theta\, d\theta$

$\theta = 71.5° = 1.2479$ radians

$\left|\frac{dh}{x}\right| = \left|\frac{50\sec^2(1.2479)}{50\tan(1.2479}d\theta\right|$

$\leq .06$

$\left|\frac{9.9316}{2.9886}\,d\theta\right| \le .06$

$|d\theta| \le .018$

44) $\sqrt[3]{26}$ $\quad f(x) = \sqrt[3]{x}$ $\quad x = 27$ $\quad dx = -1$

$f(x+dx) \approx f(x) + f'(x)\,dx$

$= \sqrt[3]{x} + \frac{1}{3\sqrt[3]{x^2}}\,dx = \sqrt[3]{27} + \frac{1}{3\sqrt[3]{(27)^2}}(-1)$

$= 3 - \frac{1}{27} \approx 2.9630$

with calculator $\sqrt[3]{26} \approx 2.9625$