8.4 #43

use ① $\cos(x+y) = \cos x \cos y - \sin x \sin y$

② $\cos(x-y) = \cos x \cos y + \sin x \sin y$

to prove $2\sin x \sin y = \cos(x-y) - \cos(x+y)$

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② − ① ⟺ $\cos(x-y) = \cos x \cos y + \sin x \sin y$

$+ (-\cos(x+y) = -\cos x \cos y + \sin x \sin y)$

$\cos(x-y) - \cos(x+y) = \sin x \sin y + \sin x \sin y$

$= 2\sin x \sin y$ ✓

#53 ① $\log x + \log y = 71$

$+$ ② $2\log x - \log y = 2$

$3\log x = 73$

$\log x = 73/3$

$10^{73/3} = x$

① $\log(10^{73/3}) + \log y = 71$

$73/3 + \log y = 71$

$\log y = 71 - \frac{73}{3}$

$\log y = \frac{213-73}{3}$

$\log y = \frac{140}{3}$

$y = 10^{140/3}$

intersection pt:

$(10^{73/3}, 10^{140/3})$

or $(\sqrt[3]{10^{73}}, \sqrt[3]{10^{140}})$