Some Diophantine equations with exponential and power functions.

$$3^x = x^9$$

$$4^x = x^4$$

$$4^x = x^{64}$$

$$8^x = x^6$$

$$5^x = x^{625}$$

$$25^x = x^{1250}$$

$$125^x = x^{1875}$$

$$64^x = x^{12}$$

$$27^x = x^9$$

$$729^x = x^{54}$$

$$3^x = x^{2187}$$

$$3^x = x^{282429536481}$$

$$3^x = x^{54744010894202193820771559335697517 63}$$

$$4^x = x^{64}$$

$$4^x = x^{268435456}$$

$$4^x = x^{53169119831396634916152282411213783 04}$$

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Heine Strømdahl, 11-01-2026.

$$5^x = x^{625}$$

$$5^x = x^{11920928955078125}$$

$$64^x = x^{12}$$

$$7^x = x^{117649}$$

$$7^x = x^{524333831675630363446145871886195145554 3}$$

$$\textit{En løsning til ovenstående er } x = 256923577521058878088611477224235621321607$$

$$3^x = x^{3588051131109504452794694262792624349669303391141224283354947301974936917437178598496936210157682432789755359080 89}$$

Heine Strømdahl, 08-01-2026.

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Heine Strømdahl, 11-01-2026.