FactorInteger[3259832]

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{{2, 3}, {29, 1}, {14051, 1}}
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PrimeQ[978]

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False
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Expand[(3 x^2 - 2 x + 7) ^3 / (2 x + x^3 + 8) ^2]

$$\frac{343}{(8+2x+x^3)^2} - \frac{294x}{(8+2x+x^3)^2} + \frac{525x^2}{(8+2x+x^3)^2} - \frac{260x^3}{(8+2x+x^3)^2} + \frac{225x^4}{(8+2x+x^3)^2} - \frac{54x^5}{(8+2x+x^3)^2} + \frac{27x^6}{(8+2x+x^3)^2}$$

Simplify[3 / (4 x - 3) + (7 x^3 + 3) / (16 x^2 - 24 x + 9)]

$$\frac{-6+12x+7x^3}{(3-4x)^2}$$

Simplify[3 / (4 x - 3) + (7 x^3 + 3) / (16 x^2 - 20 x + 9)]

$$\frac{3}{-3+4x} + \frac{3+7x^3}{9-20x+16x^2}$$

In[4]:=

Factor[x^3 + 3 x^2 + 3 x + 1]

Out[4]= $(1+x)^3$