



2. Consider the number  $n = e^{\sqrt{\pi}}$ .

(a) Give a numerical approximation of  $n$  with 6 decimal places.

(b) Give a rational approximation for  $n$ , accurate up to 6 decimal places.

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3. (a) Give the Maple commands to transform

$$(x+1)(x+4) + \frac{1}{(x+1)(x+4)} \quad \text{into} \quad \frac{x^4 + 10x^3 + 33x^2 + 40x + 17}{x^2 + 5x + 4}.$$

(b) Give the Maple commands to transform

$$\frac{x^4 + 10x^3 + 33x^2 + 40x + 17}{x^2 + 5x + 4} \quad \text{into} \quad (x+1)(x+4) + \frac{1}{(x+1)(x+4)}.$$

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5. Consider the polynomial  $p = x^3 + 4x + 9$ .

(a) Show that the  $p$  is irreducible over the rational numbers.

(b) Compute a numerical factorization of  $p$ .

(c) Compute a symbolic factorization of  $p$ .

(d) Show how to go from the symbolic to the numerical factorization.

6. Consider  $r = \frac{15z^{32}-3z^4+1}{3z^{24}+4z^8-3}$ . What is the most efficient way to evaluate  $r$ ?  
Give all Maple commands and their output in your answer.

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