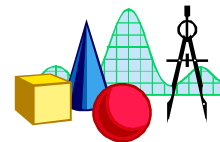




# MATH DEPT. TUTORIAL 12



## Tutorial 12: Long Division

- Use long division to find the quotient and remainder for each of the following.
  - dividend  $2x^2 + 10x + 12$       divisor  $x + 3$
  - dividend  $4x^3 - 7x^2 - 11x + 5$       divisor  $x - 4$
  - dividend  $x^4 + 5x^3 + 6x^2 - x - 2$       divisor  $x + 2$
  - dividend  $6x^3 + 10x^2 + x + 8$       divisor  $2x^2 + 1$
  - dividend  $x^5 - 13x^4 + 250x + 80$       divisor  $x - 3$
  - dividend  $x^4 + 3x^2 + 1$       divisor  $x^2 - 2x + 3$
- Given that  $x - 2$  is a factor of  $x^3 - 4x^2 + x + 6$ , find the other two factors.
  - Given that  $x + 1$  and  $x - 3$  are factors of  $x^4 - 6x^3 + 9x^2 + 4x - 12$ , find the other two factors.
  - Given that  $x^2 + 2$  is a factor of  $x^5 + 2x^3 - 8x^2 - 16$ , find the other two factors.
- Use the factor theorem to show each of the following.
  - $x - 3$  is a factor of  $x^4 + x^3 - 9x^2 - 27$
  - $x + 1$  is a factor of  $x^{10} + x^9 + x^6 + x^3 + x + 1$
  - $x - 2$  is a factor of both  $x^5 - 4x^4 + 5x^3 - 3x^2 + 4$  and its derivative.