9.8: Factor Polynomials Completely

Goals: *Factor a common binomial
*Factor polynomials by grouping
*Factor polynomials completely

Factor a common binomial:

Ex: $2x(x + 4) - 3(x + 4)$

Ex: $4x(x - 3) + 5(x - 3)$

Ex: $3y^2(y - 2) + 5(2 - y)$

Ex: $2y^2(y - 5) - 3(5 - y)$

Ex: $x(x - 2) + (x - 2)$

Factor by grouping:

Ex: $x^3 + 3x^2 + 5x + 15$

Ex: $y^2 + y + yx + x$

Ex: $a^3 + 3a^2 + a + 3$

Ex: $x^3 + 2x^2 + 8x + 16$

Ex: $r^2 + 4r + rs + 4s$

Factoring by grouping (rearrange first):

Ex: $x^3 - 6 + 2x - 3x^2$

Ex: $y^2 + 2x + yx + 2y$

Ex: $x^3 - 10 - 5x + 2x^2$

Factor completely:

Ex: $n^2 + 2n - 1$

Ex: $4x^3 - 44x^2 + 96x$

Ex: $50h^4 - 2h^2$

Ex: $3x^3 - 12x$

Ex: $2y^3 - 12y^2 + 18y$

Ex: $m^3 - 2m^2 - 8m$

Ex: $x^2 - 4x - 3$

Ex: $3x^3 - 21x^2 - 54x$

Ex: $x^4 - x^2 + 3x^2 - 3$

Ex: $8d^3 + 24d$

Solve:

Ex: $3x^3 + 18x^2 = -24x$

Ex: $w^3 - 8w^2 + 16w = 0$

Ex: $c^3 - 7c^2 + 12c = 0$

Ex: $2x^3 - 18x^2 = -36x$

Terrarium A terrarium in the shape of a rectangular prism has a volume of 4608 cubic inches. Its length is more than 10 inches. The dimensions of the terrarium are shown. Find the length, width and the height of the terrarium.