ANSWERS

Practice Factoring: Show all Work for complete marks!!

Factor $x^2 - x - 12$.

Solution. We must find ***factors of 12*** whose algebraic *sum will be the coefficient of x, which is −1.* Choose −4 and + 3:

$x^2 - x - 12 =$ $(x - 4)(x + 3)$. Check FOIL answer

Problem 4. Factor. Again, the order of the factors does not matter.

a) $x^2 + 5x + 6 =$ $(x + 2)(x + 3)$

b) $x^2 - x - 6 =$ $(x - 3)(x + 2)$

c) $x^2 + x - 6 =$ $(x + 3)(x - 2)$

d) $x^2 - 5x + 6 =$ $(x - 3)(x - 2)$

e) $x^2 + 7x + 6 =$ $(x + 1)(x + 6)$

f) $x^2 - 7x + 6 =$ $(x - 1)(x - 6)$

g) $x^2 + 5x - 6 =$ $(x - 1)(x + 6)$

h) $x^2 - 5x - 6 =$ $(x + 1)(x - 6)$

Problem 5. Factor.

a) $x^2 - 10x + 9 =$ $(x - 1)(x - 9)$

b) $x^2 + x - 12 =$ $(x + 4)(x - 3)$

c) $x^2 - 6x - 16 =$ $(x - 8)(x + 2)$

d) $x^2 - 5x - 14 = ($ $x - 7)(x + 2)$

e) $x^2 - x - 2 =$ $(x + 1)(x - 2)$

f) $x^2 - 12x + 20 =$ $(x - 10)(x - 2)$

g) $x^2 - 14x + 24 =$ $(x - 12)(x - 2)$

Example 3. Factor completely $6x^8 + 30x^7 + 36x^6$.

Solution. To factor completely means to first remove any__GCF

Problem 6. Factor completely. First remove any common factors.

a) $x^3 + 6x^2 + 5x = x(x^2 + 6x + 5) =$ $x(x + 5)(x + 1)$

b) $x^5 + 4x^4 + 3x^3 = x^3(x^2 + 4x + 3) =$ $x^3(x + 1)(x + 3)$

c) $x^4 + x^3 - 6x^2 = x^2(x^2 + x - 6) =$ $x^2(x + 3)(x - 2)$

d) $4x^2 - 4x - 24 = 4(x^2 - x - 6) =$ $4(x + 2)(x - 3)$

e) $2x^3 - 14x^2 - 36x = 2x(x^2 - 7x - 18) =$ $2x(x + 2)(x - 9)$

f) $12x^{10} + 42x^9 + 18x^8 = 6x^8(2x^2 + 7x + 3) =$ $6x^8(2x + 1)(x + 3)$.

2nd Level

Example 4. Factor by making the **<u>leading term</u>** positive.

$-x^2 + 5x - 6 = -(x^2 - 5x + 6) = -(x - 2)(x - 3)$.

Problem 7. Factor by making the leading term positive.

a) $-x^2 - 2x + 3 = -(x^2 + 2x - 3) =$ $-(x + 3)(x - 1)$

b) $-x^2 + x + 6 = -(x^2 - x - 6) =$ $-(x + 2)(x - 3)$

c) $-2x^2 - 5x + 3 = -(2x^2 + 5x - 3) =$ $-(2x - 1)(x + 3)$