

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 $+3$:

$$x^2 - x - 12 = (x - 4)(x + 3). \quad \text{Check; FOIL answer}$$

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

a) $x^2 + 5x + 6 =$ _____

b) $x^2 - x - 6 =$ _____

c) $x^2 + x - 6 =$ _____

d) $x^2 - 5x + 6 =$ _____

e) $x^2 + 7x + 6 =$ _____

f) $x^2 - 7x + 6 =$ _____

g) $x^2 + 5x - 6 =$ _____

h) $x^2 - 5x - 6 =$ _____

Problem 5. Factor.

a) $x^2 - 10x + 9 =$ _____

b) $x^2 + x - 12 =$ _____

c) $x^2 - 6x - 16 =$ _____

d) $x^2 - 5x - 14 =$ _____

e) $x^2 - x - 2 =$ _____

f) $x^2 - 12x + 20 =$ _____

g) $x^2 - 14x + 24 =$ _____

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

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

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

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

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

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

2nd Level

Example 4. Factor by making the **leading term** positive.

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

Problem 7. Factor by making the leading term positive.

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

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

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