

## 2.3 Factor Theorem Worksheet

This document was composed and formatted by Annie Bernatchez.

The course material originated from [www.jensenmath.ca](http://www.jensenmath.ca)

1) Determine if  $x + 3$  is a factor of each polynomial:

a)  $x^3 + x^2 - x + 6$

b)  $2x^3 + 9x^2 + 10x + 3$

c)  $x^3 + 27$

2) Find possible factors of the following polynomials using the integral zero theorem. Then, factor the polynomial.

a)  $x^3 + 3x^2 - 6x - 8$

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b)  $x^3 + 4x^2 - 15x - 18$

c)  $x^3 - 3x^2 - 10x + 24$

3) Factor by grouping:

a)  $x^3 + x^2 - 9x - 9$

b)  $2x^3 - x^2 - 72x + 36$

4) Determine a value of  $k$  so that  $x + 2$  is a factor of  $x^3 - 2kx^2 + 6x - 4$ .

5) Find possible factors of the following polynomials using the integral zero theorem. Then, factor the polynomial.

a)  $3x^3 + x^2 - 22x - 24$

b)  $2x^3 - 9x^2 + 10x - 3$

c)  $6x^3 - 11x^2 - 26x + 15$

d)  $4x^3 + 3x^2 - 4x - 3$

6) Factor each polynomial

a)  $2x^3 + 5x^2 - x - 6$

b)  $4x^3 - 7x - 3$

c)  $x^4 - 15x^2 - 10x + 24$

## Answer Key

1) a) Not a factor b) A factor c) A factor

2) a)  $(x + 1)(x + 4)(x - 2)$  b)  $(x + 1)(x + 6)(x - 3)$  c)  $(x - 2)(x - 4)(x + 3)$

3) a)  $(x + 1)(x - 3)(x + 3)$  b)  $(2x - 1)(x - 6)(x + 6)$

4)  $k = -3$

5) a)  $(x + 2)(x - 3)(3x + 4)$  b)  $(x - 1)(x - 3)(2x - 1)$  c)  $(x - 3)(3x + 5)(2x - 1)$  d)  $(x - 1)(x + 1)(4x + 3)$

6) a)  $(x - 1)(x + 2)(2x + 3)$  b)  $(x + 1)(2x - 3)(2x + 1)$  c)  $(x - 1)(x + 2)(x - 4)(x + 3)$