Quiz 2.4 – Analyzing Cubic Functions

1. **(1 point) —alfredLibrary/AUCI/chapter2/lesson4/quiz/grouping1pet.pg—**
Use the method of grouping to factor the cubic completely:

$x^3 - 7x^2 - 36x + 252 =$ _____

(HINT: Notice that $252 = 36 \cdot 7$.)

2. **(1 point) —alfredLibrary/AUCI/chapter2/lesson4/quiz/cubiczeros1pet.pg—**
Find a real zero of the polynomial

$$P(x) = x^3 - 5x + 2$$

by using the "guess-and-check" method with some small positive and negative integers. Then use long division to get a quadratic factor and use it to find any remaining zeros.

If the cubic has less than three real zeros, then input them in the boxes from left to right and leave the remaining boxes blank. Enter EXACT answers only (no decimal approximations).

In increasing order, from smallest to largest, the real zeros are

$x_1 =$ ___ $x_2 =$ ___ $x_3 =$ ___

3. **(1 point) —alfredLibrary/AUCI/chapter2/lesson4/quiz/question7pet.p**
Suppose that $f(x) = x^3 - 7x^2 + 2$.

(a) List all the critical points of f. If there are no critical points, then enter the word NONE:
$x =$ _____

(Now perform a number-line sign test for the derivative function.)

(b) Use **interval notation** to indicate where f is increasing:
_____

(c) Use interval notation to indicate where f is decreasing:
_____

(d) List the x-values of all local maxima of f. If there are no local maxima, then enter the word NONE:
$x =$ _____

(e) List the x-values of all local minima of f. If there are no local minima, then enter the word NONE:
$x =$ _____