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1  // A validator to check and verify something has a factored form...
2  function factorCheck(f,g) {
3      // This validator is designed to check that a student is submitting a factored polynomial
4      // Checking that there are the correct number of non-numeric and non-inverse factors as
5      // Checking that the submitted answer and the expected answer are the same via real Xronos
6      // Checking that the outer most (last to be computed when following order of operations)
7
8      var operCheck = f.tree[0]; // Check to see if the root operation is multiplication at end
9      var studentFactors = f.tree.length; // Temporary number of student-provided factors (+1 for root)
10
11     // Now we adjust the length to remove any numeric factors, or division factors, etc to a
12     for (var i = 0; i < f.tree.length; i++) {
13         if ((typeof f.tree[i] === 'number') || (f.tree[i][0] == '-') || (f.tree[i][0] == '/')) {
14             studentFactors = studentFactors - 1;
15         }
16     }
17
18     // Now we do the same with the provided answer, in case sage or something provides a weird
19     var answerFactors = g.tree.length;
20
21     // Adjust length in the same way, so that it will match the students if it should.
22     for (var i = 0; i < g.tree.length; i++) {
23         if (typeof g.tree[i] === 'number') {
24             answerFactors = answerFactors - 1;
25         }
26     }
27
28     // Note: An especially dedicated student could pad with weird factors that are happen to
29     // For example, a student could enter sin^2(x)+cos^2(x) as a multiplicative factor to pad
30     // This would be somewhat difficult to think of, even on purpose.
31     // Until I can reliably evaluate the factors themselves as functions though, there isn't
32
33     return ((f.equals(g)) && (studentFactors == answerFactors) && (operCheck == '*'))
34 }

```

Note: This is using an experimental factoring validator. If you verified that your answer should be correct and Xronos won't take it, please email your instructor to see if there is a problem.

Problem 1 Factor the following polynomial:

$$8x^3 - 729 = \boxed{(4x^2 + 18x + 81)(2x - 9)}$$

Factor Coefficients Method Practice 1

Feedback(attempt): If the degree of the polynomial is even, then it's a good idea to start with difference of squares (if possible). If it isn't even, but is divisible by 3, then you can try a difference/sum of cubes.

Problem 2 Factor the following polynomial:

$$-64x^3 - 729 = \boxed{(16x^2 - 36x + 81)(-4x - 9)}$$

Feedback(attempt): If the degree of the polynomial is even, then it's a good idea to start with difference of squares (if possible). If it isn't even, but is divisible by 3, then you can try a difference/sum of cubes.

Problem 3 Factor the following polynomial:

$$-125x^3 - 343 = \boxed{(25x^2 - 35x + 49)(-5x - 7)}$$

Feedback(attempt): If the degree of the polynomial is even, then it's a good idea to start with difference of squares (if possible). If it isn't even, but is divisible by 3, then you can try a difference/sum of cubes.
