

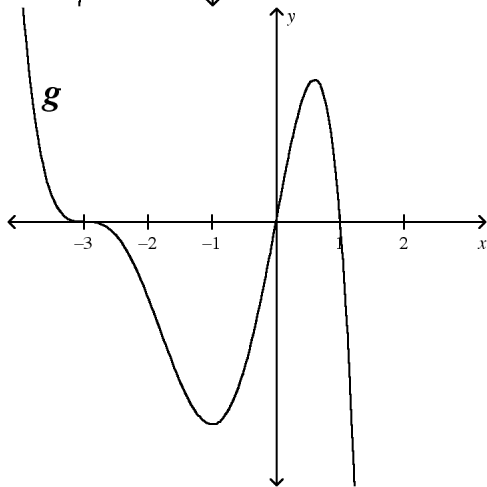
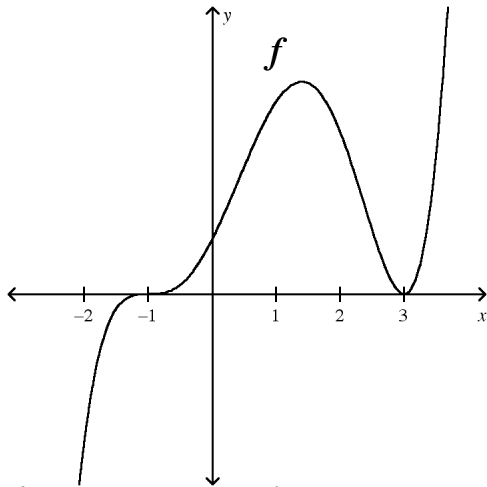
Intro to Calculus Test 4 Mr. Holcomb 2008/2009

Best Thanksgiving food:

Problem

1. (6 points) What should a student look for in a graph of a function in order to conclude that the function may represent a polynomial function?
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2. (10 points) Write $f(x) = x^4 + 3x^3 - 2x^2 - 10x - 12$ as a product of irreducible factors. Justify with clear and complete work.
.
3. (14 points) Write a polynomial expression to match the following descriptions.
 - a. The graph of f ,
 - passes through the x -axis at -3 ,
 - touches but does not cross the x -axis at 0 ,
 - whenever $x > 0$, $f(x) > 0$
 - b. The graph of g ,
 - “flexes” when it crosses the x -axis at -2
 - passes through the x -axis at 4
 - has a y -intercept of 8
 - whenever $x < -2$, $f(x) > 0$

4. (16 points) A graph of a polynomial function is shown. Create a function which could represent this function.



5. (8 points) If $x - 2$ is a factor of $f(x) = x^6 + ax^5 - 3x^4 + x^2 + 7x - 2$, then what is a value of a ?

6. (15 points) A rectangular box (without top) has a square base. The sum of the lengths of its 12 edges is 144. What dimensions should the box have so that its surface area is as large as possible? Justify with clear and complete work. Round your final answer to the nearest tenth of a unit.

7. (15 points) A farmer has 100 meters of fence to build a pen using an existing wall as one side of the pen as shown in the diagram below. What is the maximum possible area for the pen? Justify with clear and complete work. Round your final answer to the nearest hundredth of a unit.

