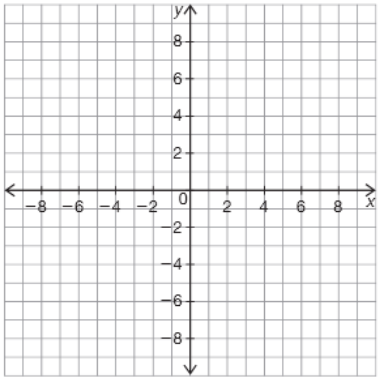
LESSON 3.5 Assignment

Name _____ Date _____

That Graph Looks a Little Sketchy

Building Cubic and Quartic Functions

1. Consider the functions $k(x) = x - 1$, $m(x) = x + 2$, $n(x) = x - 3$, and $f(x) = k(x) \cdot m(x) \cdot n(x)$.



a. Graph $k(x)$, $m(x)$, and $n(x)$.

b. Determine the degree of the function $f(x)$. Explain your reasoning.

c. Determine the zeros of $f(x)$. Explain your reasoning.

d. Determine the y-intercept of $f(x)$. Explain your reasoning.

e. Determine the intervals over which the value of $f(x)$ is positive. Determine the intervals over which the value of $f(x)$ is negative. Explain your reasoning.

f. Sketch $f(x)$.

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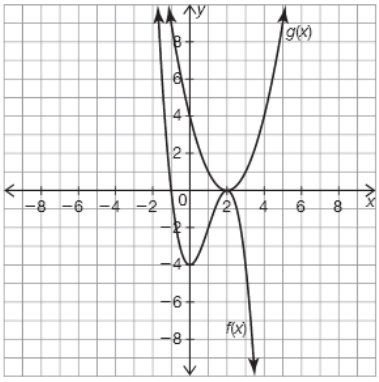
2. Consider the graphs of the quadratic function $g(x) = (x - 2)^2$ and the cubic function $f(x) = g(x) \cdot h(x)$.



a. Determine the degree of the function $h(x)$. Explain your reasoning.

b. Determine the x-intercept(s) of $h(x)$. Explain your reasoning.

c. Determine the y-intercept of $h(x)$. Explain your reasoning.

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d. Determine the equation of the function $h(x)$. Explain your reasoning.

3. Determine 2 linear functions and 1 quadratic function such that the product of the 3 functions will build a quartic function with a double root at -1 and a y-intercept at $(0, -3)$. Write the equation of the quartic function. Explain your reasoning.

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4. Determine 2 quadratic functions such that the product of the 2 functions will build a quartic function with only 2 x-intercepts at $(-2, 0)$ and $(1, 0)$ and a y-intercept at $(0, -8)$. Write the equation of the quartic function. Explain your reasoning.