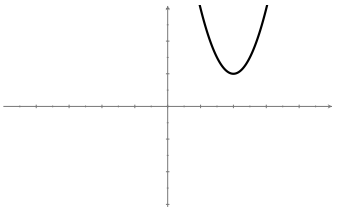
Unit 3 Practice Exam

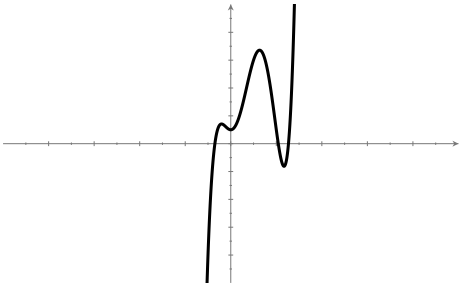
1. $f(x) = a(x-h)^2 + k$ is graphed to the right. Sketch the graphs of:
   - $g(x) = -a(x-h)^2 - k$
   - $h(x) = a(x+h)^2 + k$



2. Sketch the graph of, and find the formula for, a 3rd degree polynomial that:
   - has a positive leading coefficient
   - has zeros at x = -1 and x = 2 (with no other zeros)
   - goes through the point (1, 8)

3. Find the formula for a quadratic function that goes through (-1, -4) and has a vertex at (2, 4).

4. A polynomial is graphed below. Determine the following:



Minimum degree: _____ # of extrema: _____

Leading coefficient is (circle one): positive negative

# of zeros: _____ # of inflection points: _____

5. Find the zeros and vertex of $f(x) = -3x^2 - 4x + 10$.

6. Find horizontal and vertical asymptotes: $f(x) = \dfrac{3x^2+7}{x-4}$ $g(x) = \dfrac{2x^2-4x-6}{4x^2+20x+16}$ $h(x) = \dfrac{3x^3+7x-12}{x^2+4}$

7. Write the formula for a rational function with a vertical asymptote at x=3 and a horizontal asymptote at y=4.

8. We need to fence off another rectangular area that separates our male alpacas, female alpacas, and one particularly antisocial alpaca. We again have 1200 yards of fence. What's the maximum area we can enclose?