Work on these with your partner(s) at the board

1. Find the derivative of each function and verify by graphing both on the same set of axes

   (a) $f(x) = 3x - x^3 + 2$

   (b) $f(x) = 6\sqrt{x} - x^{\frac{3}{2}}$

   (c) $f(x) = \dfrac{1}{x^2} - x^4$

   (d) $f(x) = \dfrac{1}{\sqrt[3]{x}} + x$

   (e) $f(x) = 3\sin(x) + e^x$

   (f) $f(x) = \ln(x) - 2\cos(x)$

2. Let $g(x) = x^5 - 4x^3 + x^2 + 3x$

   (a) Find $g'(x)$ and $g''(x)$

   (b) Verify by graphing all three functions on the same set of axes
   Be sure to check that your graphs make sense!

3. Let $f(x) = 3x^2 + x - 5$

   (a) Find a function $F(x)$ whose derivative is equal to $f(x)$

   (b) Verify your answer by graphing both functions on the same set of axes
   Be sure to check that your graphs make sense!