Name: _____

- **Keep phones off and out sight.**
- **Do not talk during the quiz.**
- **No calculators, notes, books, or other aids.**
- **Show all work.**

Differentiation rules reference (this will not be printed on the midterm; include them on your note sheet!):

$$(f \cdot g)'(x) = f'(x)g(x) + f(x)g'(x)$$

$$(f/g)'(x) = \frac{f'(x)g(x) - f(x)g'(x)}{g(x)^2}$$
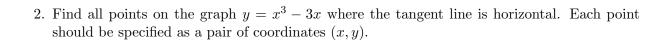
$$(f \circ g)'(x) = f'(g(x)) \cdot g'(x)$$

1. Differentiate each function using the differentiation rules from the past week.

   (a) $f(x) = 7x^3 - 2x + 3$

   (b) $f(x) = \dfrac{x + 2}{x^2 + 3}$

   (c) $f(x) = \sqrt{5x - 2}$

---

2. Find all points on the graph $y = x^3 - 3x$ where the tangent line is horizontal. Each point should be specified as a pair of coordinates (x, y).

3. Find an equation for the tangent line to the curve $y = x\sqrt{x}$ at the point where $x = 4$.