WORKSHEET: FIRST LOOK AT ANTIDERIVATIVES

Names and student IDs: ____________________________________________________________

1. Find a function $F$ such that $F'(x) = 0$ for all real $x$. Find a second such function. What is the most general function with derivative 0 you can think of?

2. Find a function $F$ such that $F'(x) = 2$ for all real $x$. Find a second such function. What is the most general function with derivative 2 you can think of?

3. Find a function $F$ such that $F'(x) = 2x$ for all real $x$. Find a second such function. What is the most general function with derivative $2x$ you can think of?

4. Find the most general function $G$ such that $G'(x) = x$ for all real $x$. Hint: Compare with the answer to Problem 3.

5. Find the most general function $H$ such that $H'(x) = 7x$ for all real $x$.

6. Find the most general function $F$ such that $F'(x) = x^2$ for all real $x$.

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7. Find the most general function \( L \) such that \( L'(x) = x^2 + 7x \) for all real \( x \). (Hint: Use the answers to Problems 5 and 6.)

8. Find the most general function \( F \) such that \( F'(x) = \cos(x) \) for all real \( x \).

9. Find the most general function \( G \) such that \( G'(x) = \cos(3x) \) for all real \( x \). (Hint: If you know \( F'(x) \), what does the Chain Rule tell you about \( \frac{d}{dx}(F(3x)) \)?)

10. Find the most general function \( G \) such that \( G'(x) = x\cos(x^2) \) for all real \( x \). (Hint: If you know \( F'(x) \), what does the Chain Rule tell you about \( \frac{d}{dx}(F(x^2)) \)?)

11. Suppose you know a function \( F \) such that \( F'(x) = \arctan(x) \) for all real \( x \). Find the most general function \( G \) such that \( G'(x) = \arctan(3x) \) for all real \( x \). Your answer will probably involve the function \( F \).

12. Suppose you know a function \( F \) such that \( F'(x) = f(x) \) for all real \( x \). Find the most general function \( G \) such that \( G'(x) = f(6x) \) for all real \( x \). Your answer will probably involve the function \( F \).