Math 263A Class Drill 7: The Mean Value Theorem

The Theorem as stated in the book:

> **The Mean Value Theorem**
> Let f be a function that satisfies the following hypotheses:
> - f is continuous on the closed interval $[a,b]$
> - f is differentiable on the open interval (a,b)
>
> Then there exists a number c in the open interval (a,b) such that $f'(c)=\dfrac{f(b)-f(a)}{b-a}$.

When we "use" this theorem (or any other), we start by verifying explicitly that all of the hypotheses are satisfied in our specific situation. If they are satisfied, then we write the conclusion, adapted to our specific situation.

Generic Hypotheses	Our Specific Hypotheses
the real number "a"	
the real number "b" such that $a < b$	
the function $f(x)$	
verification that f is continuous on the closed interval $[a,b]$	
verification that f is differentiable on the open interval (a,b)	
Generic expression used in Theorem	**actual numbers in our particular example**
the value of $f(a)$	$f(a)$ =
the value of $f(b)$	$f(a)$ =
The value of $m=\dfrac{f(b)-f(a)}{b-a}$	m =
Generic Conclusion	**Our Specific Conclusion**
"There exists a number c in the open interval (a,b) such that $f'(c)=\dfrac{f(b)-f(a)}{b-a}$."	"There exists a number c in the open interval ________ such that $f'(c)=$ _________ ."

Generic Hypotheses	Our Specific Hypotheses
the real number “a”	
the real number “b” such that $a < b$	
the function $f(x)$	
verification that f is continuous on the closed interval $[a,b]$	
verification that f is differentiable on the open interval (a,b)	
Generic expression used in Theorem	**actual numbers in our particular example**
the value of $f(a)$	$f(a) =$
the value of $f(b)$	$f(a) =$
The value of $m = \dfrac{f(b) - f(a)}{b - a}$	$m =$
Generic Conclusion	**Our Specific Conclusion**
“There exists a number c in the open interval (a,b) such that $f'(c) = \dfrac{f(b) - f(a)}{b - a}$.”	“There exists a number c in the open interval ________ such that $f'(c) =$ _________ .”

Generic Hypotheses	Our Specific Hypotheses
the real number “a”	
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the function $f(x)$	
verification that f is continuous on the closed interval $[a,b]$	
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Generic expression used in Theorem	**actual numbers in our particular example**
the value of $f(a)$	$f(a) =$
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The value of $m = \dfrac{f(b) - f(a)}{b - a}$	$m =$
Generic Conclusion	**Our Specific Conclusion**
“There exists a number c in the open interval (a,b) such that $f'(c) = \dfrac{f(b) - f(a)}{b - a}$.”	“There exists a number c in the open interval ________ such that $f'(c) =$ _________ .”