

Name: _____

Date: _____

Unit 2 Practice Test – Part 2

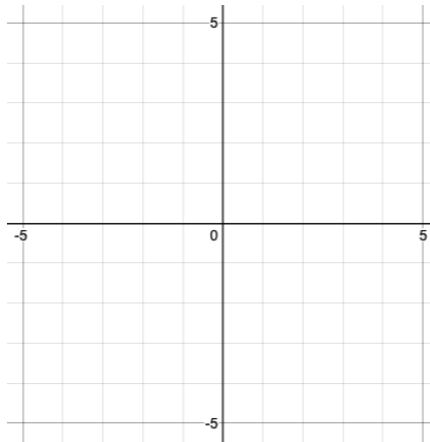
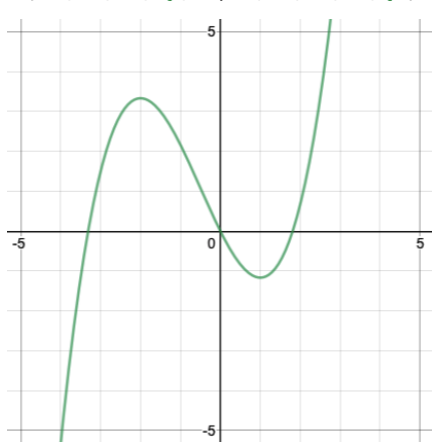
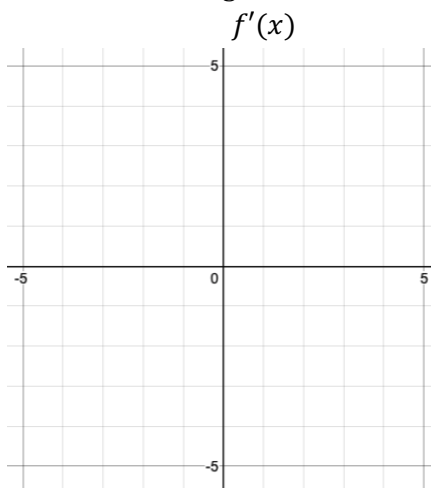
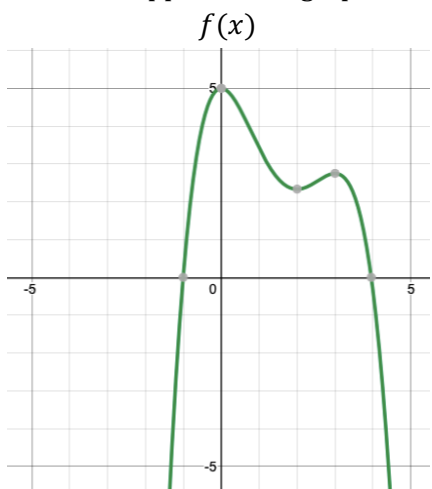
For this part of the Unit 2 test, you will be asked to complete some problems that require work to be shown for full credit.

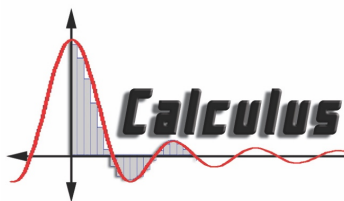
1. Show how to use the formal definition of the derivative to find $f'(x)$ if $f(x) = \frac{1}{x+3}$.

2. Evaluate this limit using derivatives:

$$\lim_{h \rightarrow 0} \frac{(2(x+h))^4 - 4(x+h)^2 - (2(x))^4 - 4x^2}{h}$$

3. Sketch an approximate graph of the derivative of the given function.





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4. For each of the following, find the equation of the line tangent to the curve at the given point (which you will need to find).

a. $y = e^{x^2-1}$ when $x = 1$

b. $y = (x^3 + 3x)(\cos x)$ when $x = 0$

5. Find the second derivative. Show your steps

$$f(x) = \arccos(2x^2 + 3)$$

6. Find the $\frac{d^2y}{dx^2}$ if $2y + xy^2 = (y + 5)^3$. State your answer in terms of x and y only.

7. If $f(x)$ and $g(x)$ are inverse functions, use the table below to find the value of $f'(5)$

x	$f(x)$	$g(x) = f^{-1}(x)$	$g'(x)$
3	7	5	$\frac{2}{3}$
5	3	7	$\frac{7}{2}$