

Name:

Partners:

PreCalculus

Date:

Review 9 Version A

[A] Circle whether each statement is true or false.

T F 1. $(\frac{4}{3})^{250} \approx 1.3^{250}$

T F 2. The derivative function of $f(x) = 5$ is $f'(x) = 1$.

T F 3. The derivative of brightness is change in brightness.

T F 4. The slope of $f(x) = x^3$ at $x = 5$ is approximately $\frac{5 \cdot 1^3 - 5^3}{.1}$.

T F 5. $f(x) = \frac{11}{3x-12}$ is continuous at all values of x except $x = 4$.

T F 6. If $q'(6) = 15$, then the slope of function q is 15 when $x = 6$.

T F 7. The series $400 + 405 + 410 + 415 + \dots + 500$ has 20 terms.

T F 8. At any point on the graph of $f(x) = e^x$, the slope is the same as the value of y .

T F 9. At any given value for x , the slope of $f(x) = 2 \tan x$ is double the slope of $g(x) = \tan x$.

T F 10. At any given point on the graph of $f(x) = x^2 - 25$, the slope is double the value of x at that point.

[B] Precisely calculate the following limits if they exist.

1. $\lim_{x \rightarrow 9} \frac{x^2 - 81}{x - 9}$

2. $\lim_{x \rightarrow 7} \frac{x^2 - 9x + 14}{x - 7}$

3. $\lim_{x \rightarrow 8} \frac{x^2 - 81}{x - 8}$

4. $\lim_{x \rightarrow 3} 2x^3 + 5x - 10$

[C] Use the formula $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ to find the derivative function of the following functions, showing every step. Write only equations, and use appropriate notation for each.

1. $f(x) = x^2$

2. $f(x) = x^3$

[D] Let S be the infinite series $40 + 20 + 10 + 5 + \dots$

1. In one or more sentences, explain how you know that a sum can be calculated for this infinite series.

2. Write S in Σ notation.

3. Calculate the sum.

[E] Find the derivative function of the following functions. Use appropriate notation in your answers.

1. $a(x) = x^5$

2. $b(x) = -3x^4$

3. $c(x) = 2x$

4. $d(x) = 15$

5. $e(x) = x^5 - 3x^4 + 2x + 15$

6. $f(x) = \cos x$

[F] Let $g(x) = 3x^2$. Write only equations, and use appropriate notation for each.

1. Use the power rule to find the derivative function for g .

2. Use your answer to #1 to find the slope of g at $x = 4$.

3. Find the equation of the line tangent to g at $x = 4$.

[G] Do the following to organize your group's reviews each day.

1. Make sure your name and your partners' names are at the top of your review the first day.

2. Staple the reviews in order, all facing the same way. Put the staple in the very top left corner if everyone is finished or if the review is due; otherwise put the staple in the top right corner.

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Review 9 Version B

[A] Circle whether each statement is true or false.

T F 1. $(\frac{4}{3})^{250} \approx 1.33^{250}$

T F 2. The derivative function of $f(x) = 5$ is $f'(x) = 1$.

T F 3. The derivative of brightness is change in brightness.

T F 4. The slope of $f(x) = x^3$ at $x = 5$ is approximately $\frac{5.1^3 - 5^3}{.1}$.

T F 5. $f(x) = \frac{11}{3x-12}$ is continuous at all values of x except $x = 4$.

T F 6. If $q'(6) = 15$, then the slope of function q is 15 when $x = 6$.

T F 7. The series $400 + 405 + 410 + 415 + \dots + 500$ has 20 terms.

T F 8. At any point on the graph of $f(x) = e^x$, the slope is the same as the value of y .

T F 9. At any given value for x , the slope of $f(x) = 2 \tan x$ is double the slope of $g(x) = \tan x$.

T F 10. At any given point on the graph of $f(x) = x^2 - 25$, the slope is double the value of x at that point.

[B] Precisely calculate the following limits if they exist.

1. $\lim_{x \rightarrow -9} \frac{x^2 - 81}{x + 9}$

2. $\lim_{x \rightarrow 7} \frac{x^2 - 10x + 21}{x - 7}$

3. $\lim_{x \rightarrow -5} \frac{x^2 + 9x + 18}{x + 5}$

4. $\lim_{x \rightarrow 3} \frac{x^2 - 10x + 21}{4x + 12}$

[C] Use the formula $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ to find the derivative function of the following functions, showing every step. Write only equations, and use appropriate notation for each.

1. $f(x) = x^2$

2. $f(x) = x^4$

[D] Let S be the infinite series $135 + 90 + 60 + 40 + \dots$

1. In one or more sentences, explain how you know that a sum can be calculated for this infinite series.

2. Write S in Σ notation.

3. Calculate the sum.

[E] Find the derivative function of the following functions. Use appropriate notation in your answers.

1. $a(x) = x^6$

2. $b(x) = -12x^4$

3. $c(x) = 9x$

4. $d(x) = 1$

5. $e(x) = x^6 - 12x^4 + 9x + 1$

6. $f(x) = e^x$

[F] Let $g(x) = 3x^2 + 5$. Write only equations, and use appropriate notation for each.

1. Use the power rule to find the derivative function for g .

2. Use your answer to #1 to find the slope of g at $x = 4$.

3. Find the equation of the line tangent to g at $x = 4$.

[G] Bonus.

1. The ANTIDERIVATIVE of a Function f is a function whose derivative is f . Find the antiderivative of the following functions.

a) $f(x) = 6x$

b) $g(x) = x^2 - 8$

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Review 9 Version C

[A] Circle whether each statement is true or false.

T F 1. $(\frac{4}{3})^{250} \approx 1.33^{250}$

T F 2. The derivative function of $f(x) = 5$ is $f'(x) = 1$.

T F 3. The derivative of brightness is change in brightness.

T F 4. The slope of $f(x) = x^3$ at $x = 5$ is approximately $\frac{5 \cdot 1^3 - 5^3}{.1}$.

T F 5. $f(x) = \frac{11}{3x-12}$ is continuous at all values of x except $x = 4$.

T F 6. If $q'(6) = 15$, then the slope of function q is 15 when $x = 6$.

T F 7. The series $400 + 405 + 410 + 415 + \dots + 500$ has 20 terms.

T F 8. At any point on the graph of $f(x) = e^x$, the slope is the same as the value of y .

T F 9. At any given value for x , the slope of $f(x) = 2 \tan x$ is double the slope of $g(x) = \tan x$.

T F 10. At any given point on the graph of $f(x) = x^2 - 25$, the slope is double the value of x at that point.

[B] Precisely calculate the following limits if they exist.

1. $\lim_{x \rightarrow 9} \frac{x^2 - 18x + 81}{x - 9}$

2. $\lim_{x \rightarrow 7} \frac{4x^2 - 25x - 21}{x - 7}$

3. $\lim_{x \rightarrow 4} \frac{x^2 - 9x + 14}{x - 4}$

4. $\lim_{x \rightarrow 12} \frac{x^2 + 48x + 12}{4x - 12}$

[C] Use the formula $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ to find the derivative function of the following functions, showing every step. Write only equations, and use appropriate notation for each.

1. $f(x) = x$

2. $f(x) = x^4$

[D] Let S be the infinite series $3430 + 2450 + 1750 + 1250 + \dots$

3. In one or more sentences, explain how limits are involved in calculating the sum of this infinite series.

2. Write S in Σ notation.

3. Calculate the sum.

[E] Find the derivative function of the following functions. Use appropriate notation in your answers.

1. $a(x) = x^7$

2. $b(x) = \frac{1}{2}x^4$

3. $c(x) = x$

4. $d(x) = -1$

5. $e(x) = x^7 - \frac{1}{2}x^4 + x - 1$

6. $f(x) = 3 \sin x$

[F] Let $g(x) = 3x^2 + x + 5$. Write only equations, and use appropriate notation for each.

1. Use the power rule to find the derivative function for g .

2. Use your answer to #1 to find the slope of g at $x = 4$.

3. Find the equation of the line tangent to g at $x = 4$.

[G] Bonus.

1. The ANTIDERIVATIVE of a Function f is a function whose derivative is f . Find the antiderivative of the following functions.

a) $f(x) = 9x$

b) $g(x) = x^4 - 3x^2 - 5$

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Review 9 Version D

[A] Circle whether each statement is true or false.

T F 1. $(\frac{4}{3})^{250} \approx 1.33^{250}$

T F 2. The derivative function of $f(x) = 5$ is $f'(x) = 1$.

T F 3. The derivative of brightness is change in brightness.

T F 4. The slope of $f(x) = x^3$ at $x = 5$ is approximately $\frac{5 \cdot 1^3 - 5^3}{.1}$.

T F 5. $f(x) = \frac{11}{3x-12}$ is continuous at all values of x except $x = 4$.

T F 6. If $q'(6) = 15$, then the slope of function q is 15 when $x = 6$.

T F 7. The series $400 + 405 + 410 + 415 + \dots + 500$ has 20 terms.

T F 8. At any point on the graph of $f(x) = e^x$, the slope is the same as the value of y .

T F 9. At any given value for x , the slope of $f(x) = 2 \tan x$ is double the slope of $g(x) = \tan x$.

T F 10. At any given point on the graph of $f(x) = x^2 - 25$, the slope is double the value of x at that point.

[B] Precisely calculate the following limits if they exist.

1. $\lim_{x \rightarrow 9} \frac{x^3 - 12x}{2x^2 - 3x}$

2. $\lim_{x \rightarrow 2.5} \frac{16x^2 - 34x - 15}{2x - 5}$

3. $\lim_{x \rightarrow 10} \frac{x^2 + 16x + 63}{x - 10}$

4. $\lim_{x \rightarrow 3} \frac{x^2 - 10x + 8}{3x^2 - 5x + 9}$

[C] Use the formula $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ to find the derivative function of the following functions, showing every step. Write only equations, and use appropriate notation for each.

1. $f(x) = 2$

2. $f(x) = x^5$

[D] Let S be the infinite series $648 + 756 + 882 + 1029 + \dots$

1. In one or more sentences, use the concept of limits to explain why this infinite series does not have a finite sum.

1. Write S in Σ notation.

2. Calculate the sum of the first 100 terms.

[E] Find the derivative function of the following functions. Use function notation in your answers.

1. $a(x) = x^9$

2. $b(x) = -\frac{3}{4}x^3$

3. $c(x) = -x$

4. $d(x) = \frac{1}{4}$

5. $e(x) = x^9 - \frac{3}{4}x^3 - x + \frac{1}{4}$

6. $f(x) = 5e^x$

[F] Let $g(x) = 3x^3 - 5x^2 + 2x + 10$. Write only equations, and use appropriate notation for each.

1. Use the power rule to find the derivative function for g .

2. Use your answer to #1 to find the slope of g at $x = 4$.

3. Find the equation of the line tangent to g at $x = 4$.

[G] Bonus.

1. The ANTIDERIVATIVE of a Function f is a function whose derivative is f . Find the antiderivative of the following functions.

a) $f(x) = -3x$

b) $g(x) = 5x^3 - 4x^2 + 12$