

Student: Key  
Date: \_\_\_\_\_

Instructor: Joe Better  
Course: Pre-Calculus Pre AP (Master Course)

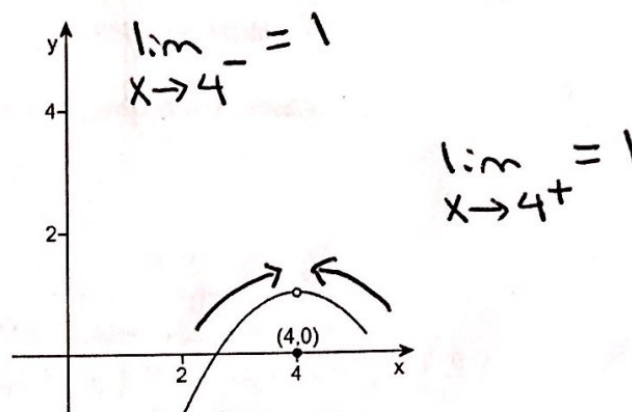
Assignment: Chapter 14 Review 2020 (Adjusted) Part 2

1. Use the graph shown to determine if the limit exists. If it does, find its value.

$$\lim_{x \rightarrow 4} f(x)$$

Select the correct choice below and fill in any answer boxes in your choice.

- A.  $\lim_{x \rightarrow 4} f(x) =$  1
- B. The limit does not exist.



ID: 14.1.19

2. Use a graphing utility to find the indicated limit rounded to two decimal places.

$$\lim_{x \rightarrow -2} \left( \frac{x^3 + 2x^2 + x + 2}{x^4 + 2x^3 - 3x - 6} \right)$$

Select the correct choice below and fill in any answer boxes in your choice.

- A.  $\lim_{x \rightarrow -2} \left( \frac{x^3 + 2x^2 + x + 2}{x^4 + 2x^3 - 3x - 6} \right) =$  -0.45 (Round to two decimal places.)
- B. The limit does not exist.

\* Since denominator equals zero, factor

$$\frac{x^2(x+2) + 1(x+2)}{x^3(x+2) - 3(x+2)}$$

$$\frac{(x^2+1)(x+2)}{(x^3-3)(x+2)}$$

Sub in -2 for x  $\frac{(-2)^2+1}{(-2)^3-3} = \frac{5}{-11} = -0.45$

ID: 14.1.43

3. Find the limit algebraically.

$$\lim_{x \rightarrow -1} (9x + 3)$$

\* sub in -1 for x  
 $9(-1) + 3 = -6$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A.  $\lim_{x \rightarrow -1} (9x + 3) =$  -6 (Simplify your answer.)
- B. The limit does not exist.

ID: 14.2.15

4. Find the limit algebraically.

$$\lim_{x \rightarrow -3} \sqrt{-2x+3}$$

\* substitute in -3 for x

$$\sqrt{-2(-3)+3} = \sqrt{9} = 3$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

A.  $\lim_{x \rightarrow -3} \sqrt{-2x+3} = \boxed{3}$  (Type an exact answer, using radicals as needed.)

B. The limit does not exist.

ID: 14.2.23

5. Find the limit as x approaches c of the average rate of change of the following function from c to x.

$$c=0; f(x) = 7x^3 + 3x^2 + 1$$

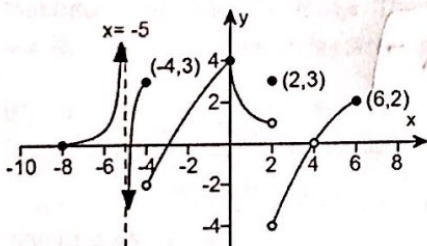
$$\frac{f(x) - f(\text{limit})}{x - \text{limit}} = \frac{(7x^3 + 3x^2 + 1) - (7(0)^3 + 3(0)^2 + 1)}{x - 0}$$

$$\lim_{x \rightarrow 0} \frac{\Delta y}{\Delta x} = \boxed{0}$$

$$\frac{7x^3 + 3x^2 + 1 - 1}{x} = 7x^2 + 3x$$

ID: 14.2.49

6. Is f continuous at 4?



Is f continuous at 4?

No  
 Yes

sub in 0 for x to get  $\boxed{0}$

at 4 there is a hole

ID: 14.3.31

7. Determine whether f is continuous at c.

$$f(x) = 5x^3 - 8x^2 + x - 2, \quad c=5$$

Is f continuous at c = 5?

No  
 Yes

$$\lim_{x \rightarrow 5^-} = 428$$

$$\lim_{x \rightarrow 5^+} = 428$$

$$\lim_{x=5} = 428$$

all the same number

ID: 14.3.45

8. Find the numbers at which  $f$  is continuous. At which numbers is  $f$  discontinuous?

$$f(x) = \frac{-8x-7}{\ln x}$$

$\ln \neq \text{negative}$   
 $\ln \neq 0$  (undefined)  
 $\ln \text{ of } 1 = 0$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The function  $f$  is continuous on the interval (Type your answer in interval notation.)
- B. The function  $f$  is not continuous anywhere.

$(0, 1) \cup (1, \infty)$

cannot divide by 0

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The function  $f$  is discontinuous on the interval (Type your answer in interval notation.)
- B. The function  $f$  is not discontinuous anywhere.

$(-\infty, 0] \cup \{1\}$

ID: 14.3.71

9. Find the derivative of  $f(x) = -2x + 7$  at  $-3$ . That is, find  $f'(-3)$ .

\* Short cut derivative

$f'(-3) =$   (Enter the value as an integer or reduced fraction.)

$-2$

$$\begin{aligned} & -2x + 7 \\ & -2x^0 \\ & = -2 \end{aligned}$$

ID: 14.4.21

10. **Instantaneous Rate of Change** The volume  $V$  of a right circular cylinder of height 4 feet and radius  $r$  feet is  $V = V(r) = 4\pi r^2$ . Find the instantaneous rate of change of the volume with respect to the radius  $r$  at  $r = 1$ .

$V'(1) =$    $\text{ft}^3 / \text{ft}$   
 (Leave  $\pi$  as a symbol in your answer. Do not use an approximation for the value of  $\pi$ .)

$8\pi$

\* Short cut derivative

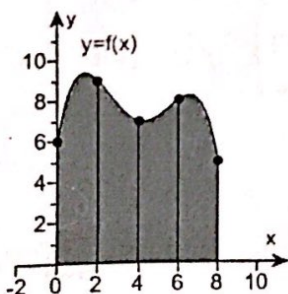
$$4\pi r^2$$

$$8\pi r^1$$

sub 1 for  $r$   $8\pi(1) = 8\pi$

ID: 14.4.43

11. Refer to the figure. The interval  $[0, 8]$  is partitioned into 4 subintervals  $[0, 2]$ ,  $[2, 4]$ ,  $[4, 6]$  and  $[6, 8]$ . Approximate the area under the graph of  $y = f(x)$  from 0 to 8 by using the right endpoint of each subinterval.



$$\frac{8-0}{4} = 2 \text{ length}$$

Type the result below.

Area  $\approx$   square units

$$\begin{aligned} & 2(f(2) + f(4) + f(6) + f(8)) \\ & 2(9 + 7 + 8 + 5) \\ & = 58 \end{aligned}$$

$f(0) = 6, f(2) = 9, f(4) = 7, f(6) = 8, f(8) = 5$

ID: 14.5.7



1. A.  $\lim_{x \rightarrow 4} f(x) =$

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2. A.  $\lim_{x \rightarrow -2} \left( \frac{x^3 + 2x^2 + x + 2}{x^4 + 2x^3 - 3x - 6} \right) =$   (Round to two decimal places.)

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3. A.  $\lim_{x \rightarrow -1} (9x + 3) =$   (Simplify your answer.)

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4. A.  $\lim_{x \rightarrow -3} \sqrt{-2x + 3} =$   (Type an exact answer, using radicals as needed.)

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5. 0

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6. No

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7. Yes

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8. A. The function  $f$  is continuous on the interval . (Type your answer in interval notation.)

A. The function  $f$  is discontinuous on the interval . (Type your answer in interval notation.)

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9. -2

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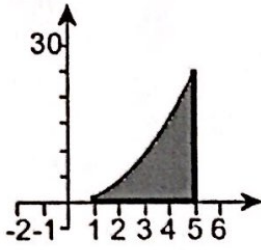
10.  $8\pi$

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11. 58

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12.



30

35.5

$$\int_1^5 x^2 dx$$

41.3333