

Student: Key
Date: _____

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

Assignment: Chapter 14 Review (Adjusted) Part 1

1. Use a table to find the indicated limit.

$$\lim_{x \rightarrow 0} \frac{x+9}{x^2+3}$$

* Since denominator $\neq 0$,
Substitute 0 in for x

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

A. $\lim_{x \rightarrow 0} \frac{x+9}{x^2+3} =$ 3

- B. The limit does not exist.

$$\frac{x+9}{x^2+3} = \frac{0+9}{(0)^2+3} = 3$$

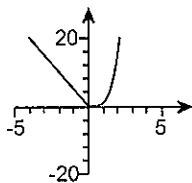
ID: 14.1.9

2. Graph the function. Use the graph to find the indicated limit, if it exists.

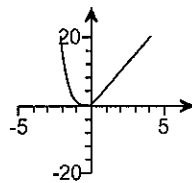
$$\lim_{x \rightarrow 0} f(x), f(x) = \begin{cases} x^4 & x \geq 0 \\ 5x & x < 0 \end{cases}$$

Select the graph of the function f.

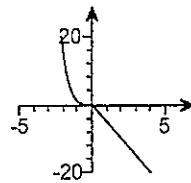
A.



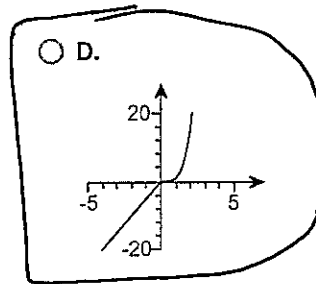
B.



C.



D.



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

A. $\lim_{x \rightarrow 0} f(x) =$ 0 (Type an exact answer.)

- B. The limit does not exist.

$$\begin{aligned} x^- \rightarrow 0 &= 0 \\ x^+ \rightarrow 0 &= 0 \\ x \text{ at } 0 &= 0 \end{aligned} \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} \begin{array}{l} \text{all the} \\ \text{same} \end{array}$$

ID: 14.1.35

3. Find the limit algebraically.

$$\lim_{x \rightarrow -3} x$$

* substitute in -3 for x

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

A. $\lim_{x \rightarrow -3} x =$

-3

-
- B. The limit does not exist.

ID: 14.2.9

4. Find the limit algebraically.

$$\lim_{x \rightarrow -3} (7x^2 + 4x)$$

substitute in -3 for x

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

A. $\lim_{x \rightarrow -3} (7x^2 + 4x) =$

~~scribble~~

(Simplify your answer.)

$$7(-3)^2 + 4(-3)$$

$$63 - 12$$

-
- B. The limit does not exist.

51

ID: 14.2.17

5. Find the limit algebraically.

$$\lim_{x \rightarrow -5} \frac{x^3 + 125}{x + 5}$$

* since denominator = 0, factor

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

A. $\lim_{x \rightarrow -5} \frac{x^3 + 125}{x + 5} =$

75

(Simplify your answer.)

$$\frac{(x+5)(x^2-5x+25)}{(x+5)}$$

-
- B. The limit does not exist.

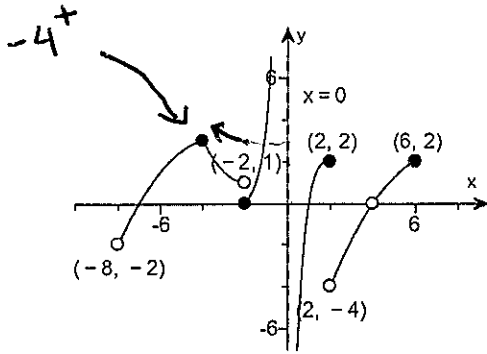
ID: 14.2.33

$$x^2 - 5x + 25 \quad \text{substitute}$$

$$-5 \text{ for } x$$

$$(-5)^2 - 5(-5) + 25$$

6. Find $\lim_{x \rightarrow -4^+} f(x)$.



$\lim_{x \rightarrow -4^+} f(x) =$ 3
 (Type an integer value.)

ID: 14.3.21

7. Find the one-sided limit.

$$\lim_{x \rightarrow -3^-} \frac{x^2 - 9}{x^3 + 27}$$

$$\lim_{x \rightarrow -3^-} \frac{x^2 - 9}{x^3 + 27} =$$

-2/9

ID: 14.3.41

Since denominator = 0 factor

$$\frac{(x+3)(x-3)}{(x+3)(x^2-3x+9)} = \frac{-3-3}{(-3)^2-3(-3)+9} = \frac{-6}{27} = -\frac{2}{9}$$

8. Determine whether f is continuous at c.

$$f(x) = \begin{cases} \frac{x^4+4x}{x^2-4x} & \text{if } x \neq 0 \\ -1 & \text{if } x = 0 \end{cases}, \quad c = 0$$

Is f continuous at c = 0?

- No
 Yes

ID: 14.3.53

$$\lim_{x \rightarrow 0^-} \frac{x^4+4x}{x^2-4x} = \frac{(-.00001)^4 + 4(-.00001)}{(-.00001)^2 - 4(-.00001)} = -1$$

$$\lim_{x \rightarrow 0^+} \frac{x^4+4x}{x^2-4x} = \frac{(.00001)^4 + 4(.00001)}{(.00001)^2 - 4(.00001)} = -1$$

* Since all approach -1
 then it is continuous

9.

Find the slope of the tangent line to the graph of $f(x) = -7x^2$ at the point $(1, -7)$. Graph f and the tangent line.

Type the slope of the tangent line, m_{tan} , in the box below.

$m_{\text{tan}} =$ (Enter the value as an integer or reduced fraction.)

Use the graphing tool to graph the function and the tangent line.

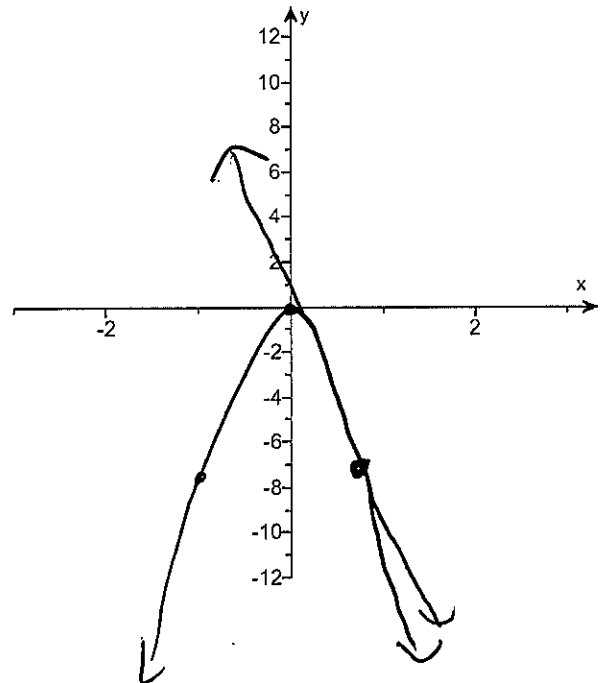
* Shortcut derivative

$$-7x^2$$

$-14x$ sub in +1 for x

$$-14(+1) = \boxed{-14}$$

ID: 14.4.13



10. Find the derivative of $f(x) = x^3 - 5x^2 + x$ at 2. That is, find $f'(2)$.

$f'(2) =$ (Enter the value as an integer or reduced fraction.)

ID: 14.4.29

* Shortcut derivative

$$\leftarrow x^3 - 5x^2 + x \quad \text{at } 2$$

$$3x^2 - 10x + 1$$

substitute 2 in for x

$$3(2)^2 - 10(2) + 1$$

$$= \boxed{-7}$$

11.

The function $f(x) = 9x$ is defined on the interval $[0, 12]$.

(a) Graph f .

In (b) – (e) approximate the area A under f from 0 to 12 as follows:

(b) By partitioning $[0, 12]$ into three subintervals of equal length and choosing u as the left endpoint of each subinterval.

(c) By partitioning $[0, 12]$ into three subintervals of equal length and choosing u as the right endpoint of each subinterval.

(d) By partitioning $[0, 12]$ into six subintervals of equal length and choosing u as the left endpoint of each subinterval.

(e) By partitioning $[0, 12]$ into six subintervals of equal length and choosing u as the right endpoint of each subinterval.

(f) What is the actual area A ?

b) $\frac{12-0}{3} = \text{length } 4$ $[0, 4]$ $[4, 8]$ $[8, 12]$

$4(f(0) + f(4) + f(8)) = 432$

c) $4(f(4) + f(8) + f(12)) = 864$

d) $\frac{12-0}{6} = \text{length } 2$ $[0, 2]$ $[2, 4]$ $[4, 6]$
 $[6, 8]$ $[8, 10]$ $[10, 12]$

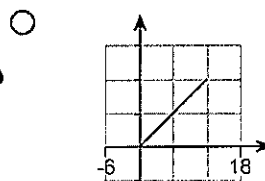
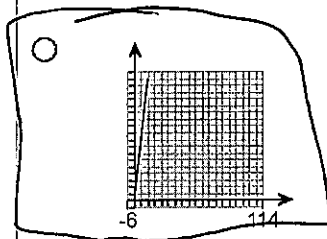
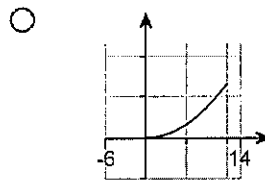
$2(f(0) + f(2) + f(4) + f(6) + f(8) + f(10) + f(12)) = 540$

e) $2(f(2) + f(4) + f(6) + f(8) + f(10) + f(12)) = 756$

~~f)~~ f) use calculator and video for integral →

ID: 14.5.9

Part (a) Choose the graph of f .



Part (b) Find the approximate area under f .

Part (c) Find the approximate area under f .

Part (d) Find the approximate area under f .

Part (e) Find the approximate area under f .

Part (f) The actual area under the graph is

$A =$
(Round to one decimal place.)

12. The following integral is given.

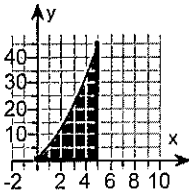
$$\int_2^7 (x^2 - 3) dx$$

- a) What area does the integral represent?
- b) Provide a graph that illustrates this area.
- c) Use a graphing utility to approximate this area.

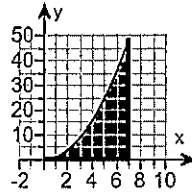
a) The integral represents the area under the graph of $f(x) = x^2 - 3$ from $x = 2$ to $x = 7$.

b) Choose the correct graph that illustrates this area below.

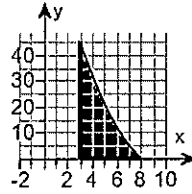
A.



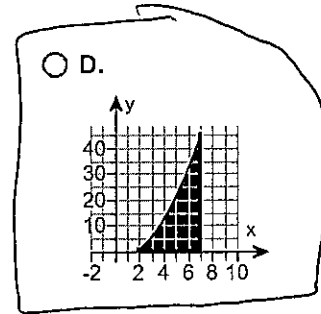
B.



C.



D.



c) Use a graphing utility to approximate this area. Consult your owner's manual for the proper keystrokes.

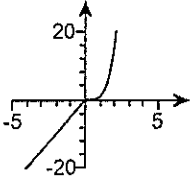
Area \approx (Round to six decimal places as needed.)

ID: 14.5.25

96.666667

use calculator
for chp. 14
see video

1. A. $\lim_{x \rightarrow 0} \frac{x+9}{x^2+3} =$



2. D.

A. $\lim_{x \rightarrow 0} f(x) =$ (Type an exact answer.)

3. A. $\lim_{x \rightarrow -3} x =$

4. A. $\lim_{x \rightarrow -3} (7x^2 + 4x) =$ (Simplify your answer.)

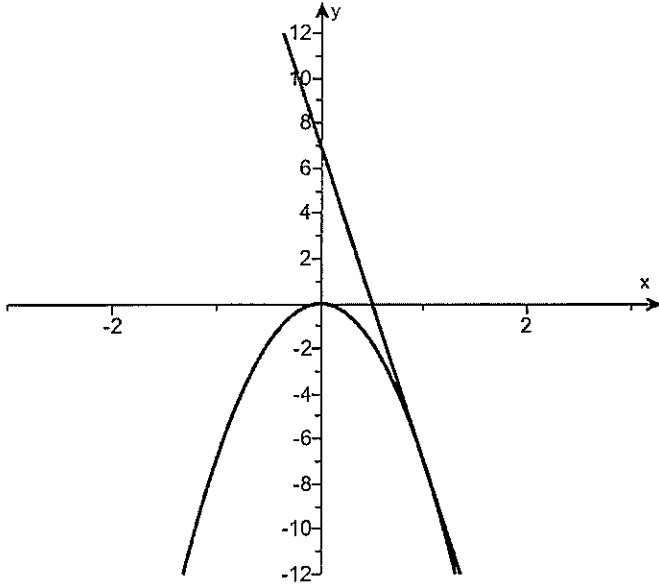
5. A. $\lim_{x \rightarrow -5} \frac{x^3 + 125}{x + 5} =$ (Simplify your answer.)

6. 3

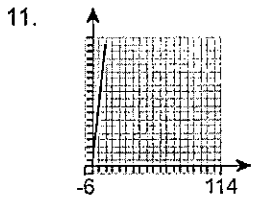
7. $-\frac{2}{9}$

8. Yes

9. - 14



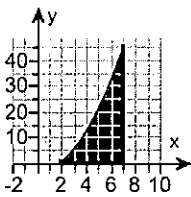
10. - 7



- 432
- 864
- 540
- 756
- 648

12. $x^2 - 3$

- 2
- 7



D.

96.666667