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1. (5 points) local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem01.pg

Solve the equation

$$\ln(5x) + \ln(3) = \ln(2x + 3).$$

- A. 0
- B.  $13/3$
- C.  $-6/17$
- D.  $19/21$
- E. 1

Correct Answers:

- B

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2. (5 points) local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem02.pg

A rover just landed safely on Mars. After it landed, if it shoots a rock upwards in the air at 10.0 m/sec, the height of the rock above the Martian surface would be given by  $s(t) = 10.0t - 1.86t^2$  meters. How fast is the rock travelling after 1 second?

- A. 8.14 m/sec
- B. 0 m/sec
- C. 10 m/sec
- D. 6.28 m/sec
- E.  $-1.86$  m/sec

Correct Answers:

- D

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3. (5 points) local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem03.pg

Compute  $\lim_{x \rightarrow 4} \frac{5x + 7}{x - 1}$ .

- A. 9
- B. 4
- C. 12
- D. 5
- E. Does not exist.

Correct Answers:

- A

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**4. (5 points)** local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem04.pg

At which point(s) is  $f(x) = \frac{(x-2)(x+3)^2}{(x-4)(x+5)}$  discontinuous.

- A.  $x = -4$  and  $x = 6$ .
- B.  $x = 4$  and  $x = -5$ .
- C.  $x = -2$  and  $x = -3$ .
- D.  $x = 2$  and  $x = -3$ .
- E.  $x = 3$  only

*Correct Answers:*

- B

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**5. (5 points)** local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem05.pg

Let

$$g(x) = \begin{cases} x-2 & \text{if } x < 5 \\ \sqrt{x^2-9} & \text{if } x \geq 5 \end{cases}$$

Compute  $\lim_{x \rightarrow 5^-} g(x)$ .

- A. 9
- B. 4
- C. 5
- D. 3
- E. Does not exist.

*Correct Answers:*

- D

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**6. (5 points)** local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem06.pg

Find  $g(5)$  and  $g'(5)$  assuming that the tangent line to  $y = g(x)$  at  $x = 5$  has the equation  $y = 2x + 3$

- A.  $g(5) = 13$  and  $g'(5) = 2$
- B.  $g(5) = 3$  and  $g'(5) = 2$
- C.  $g(5) = 2$  and  $g'(5) = 10$
- D.  $g(5) = 2$  and  $g'(5) = 3$
- E.  $g(5) = 28$  and  $g'(5) = 10$

*Correct Answers:*

- A

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7. (5 points) local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem07.pg

Which of the following theorems concludes that the function  $f(x) = 2^x - 5\cos(\pi x)$  has a zero in the interval  $\left[0, \frac{1}{2}\right]$ ?

HINT:  $f(0) = 1 - 5 < 0$  and  $f\left(\frac{1}{2}\right) = \sqrt{2} - 0$ .

- A. The limit laws
- B. The Fundamental Theorem of Calculus
- C. Intermediate Value Theorem
- D. The definition of the derivative
- E. The Squeeze Theorem

Correct Answers:

- C

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8. (5 points) local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem08.pg

Evaluate the limit  $\lim_{x \rightarrow 1} (x+5)^3(x^2-6)$ .

- A. -1070
- B. -1080
- C. -448
- D. 320
- E. -1090

Correct Answers:

- B

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9. (5 points) local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem09.pg

Find the limit  $\lim_{x \rightarrow 1} \frac{x^2 + 2x - 3}{x - 1}$ , if it exists.

- A. 4
- B. 1
- C. 2
- D. 3
- E. Does not exist.

Correct Answers:

- A

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10. (5 points) local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem10.pg

You are given that  $\lim_{x \rightarrow a} f(x) = -3$ ,  $\lim_{x \rightarrow a} g(x) = -4$ , and  $\lim_{x \rightarrow a} h(x) = 2$ . Find the limit

$$\lim_{x \rightarrow a} ((h(x))^2 - f(x)g(x)).$$

- A. 22
- B. 16
- C. -8
- D. 0
- E. 17

Correct Answers:

- C

**11. (5 points)** local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem11.pg

Let

$$f(x) = \begin{cases} cx + 5 & \text{for } x \leq 2 \\ cx^2 - 7 & \text{for } x > 2 \end{cases}$$

Find the value of  $c$  that makes  $f$  continuous on  $(-\infty, \infty)$ .

- A.  $c = -6$
- B.  $c = -2$
- C.  $c = 6$
- D.  $c = 2$
- E.  $c = 1$

Correct Answers:

- C

**12. (5 points)** local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem12.pg

Find the horizontal asymptote(s) of  $f(x) = \frac{5e^x + 3}{1 + e^x}$ .

- A.  $y = 0$  only
- B.  $y = 1$  only
- C.  $y = \ln(5)$  and  $y = \ln(3)$
- D.  $y = 5$  and  $y = 3$
- E.  $y = \frac{3}{5}$  only

Correct Answers:

- D

**13. (5 points)** local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem13.pg

If  $1 \leq f(x) \leq x^2 + 5x + 5$  for all  $x$ , find  $\lim_{x \rightarrow -1} f(x)$ .

- A. 8
- B. 1
- C.  $-\frac{1}{8}$

- D.  $-\frac{1}{16}$
- E. Does not exist.

Correct Answers:

- B

**14. (5 points)** local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem14.pg

Let  $f(x) = \frac{x^2 - 1}{|x - 1|}$ . Find the limits  $\lim_{x \rightarrow 1^+} f(x)$  and  $\lim_{x \rightarrow 1^-} f(x)$ .

- A. 2 and  $-2$
- B. 2 and  $-1$
- C. Both are 1 only
- D. 2 and 1
- E. Both are 2

Correct Answers:

- A

**15. (5 points)** local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem15.pg

Find the equation of the tangent line to the parabola  $y = 5x - x^2$  at the point  $(2, 4)$ .

- A.  $y = x + 2$
- B.  $y = \frac{\sqrt{3}}{3}x - 4$
- C.  $y = -\sqrt{6}x - 3$
- D.  $y = \sqrt{3}x - 4$
- E. None of the above.

Correct Answers:

- A

**16. (5 points)** local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem16.pg

If  $f$  and  $g$  are continuous functions with  $f(13) = 8$  and  $\lim_{x \rightarrow 13} [2f(x) - g(x)] = 15$ , find  $g(13)$ .

$g(13) =$  \_\_\_\_\_

Correct Answers:

- 1

**17. (5 points)** local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem17.pg

Find the limit

$$\lim_{x \rightarrow \infty} \frac{7 - 4x^2}{2x^2 + 3x}$$

The limit is \_\_\_\_\_

Correct Answers:

- $-2$

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**18. (5 points)** local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem18.pg

Find the limit  $\lim_{x \rightarrow 3} \frac{x-3}{x^2-9}$ .

The limit is \_\_\_\_\_

*Correct Answers:*

- 0.166667

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**19. (5 points)** local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem19.pg

Compute the limit  $\lim_{h \rightarrow 0} \frac{7(1+h)^2 - 7}{h}$ .

The limit is \_\_\_\_\_

*Correct Answers:*

- 14

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**20. (5 points)** local/GlobalPandemic/Exam01\_S21/MA113\_Exam01\_Problem20.pg

The equation of the tangent line to the graph of  $y = f(x)$  at the point  $(2, 5)$  is  $y = 1.75x + 1.5$ . Find  $f'(2)$ .

$f'(2) =$  \_\_\_\_\_

*Correct Answers:*

- 1.75