David Royster **MA113S21**
Assignment Exam01 due 02/23/2021 at 07:15pm EST

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8. **(5 points)** local/GlobalPandemic/Exam01_S21/MA113_Exam01_Problem08.pg

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

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

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4. **(5 points)** local/GlobalPandemic/Exam01_S21/MA113_Exam01_Problem04.pg

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

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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 $f'(2)$.

$f'(2)=$ _____

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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

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16. **(5 points)** local/GlobalPandemic/Exam01_S21/MA113_Exam01_Problem16.pg

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

$g(13)=$ _____

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. $c = 1$

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3. **(5 points)** local/GlobalPandemic/Exam01_S21/MA113_Exam01_Problem03.pg

Compute $\lim_{x \to 4} \dfrac{5x+7}{x-1}$.

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

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12. **(5 points)** local/GlobalPandemic/Exam01_S21/MA113_Exam01_Problem12.pg

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

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

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9. **(5 points)** local/GlobalPandemic/Exam01_S21/MA113_Exam01_Problem09.pg

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

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

10. **(5 points)** local/GlobalPandemic/Exam01_S21/MA113_Exam01_Problem10.pg

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

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

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

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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 $f(\frac{1}{2}) = \sqrt{2} - 0 > 0$.

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

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13. **(5 points)** local/GlobalPandemic/Exam01_S21/MA113_Exam01_Problem13.pg

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

- A. 8
- B. 1
- C. $-\frac{1}{8}$
- D. $-\frac{1}{16}$
- E. Does not exist.

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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 $(2,6)$.

- A. $y = x + 4$
- 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.

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

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

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18. **(5 points)** local/GlobalPandemic/Exam01_S21/MA113_Exam01_Problem18.pg

Find the limit $\lim_{x \to 3} \dfrac{x-3}{x^2-9}$.

The limit is _____

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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 $g'(5) = 10$

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14. **(5 points)** local/GlobalPandemic/Exam01_S21/MA113_Exam01_Problem14.pg

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

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

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17. **(5 points)** local/GlobalPandemic/Exam01_S21/MA113_Exam01_Problem17.pg

Find the limit

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

The limit is _____

1. **(5 points)** local/GlobalPandemic/Exam01_S21/MA113_Exam01_Problem01.pg

Solve the equation

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

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

19. **(5 points)** local/GlobalPandemic/Exam01_S21/MA113_Exam01_Problem19.pg

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

The limit is _____