1. (1 point) Suppose

$$\lim_{x\to a} g(x) = 0, \ \lim_{x\to a} h(x) = -2, \ \lim_{x\to a} f(x) = 8.$$

Find following limits if they exist. Enter **DNE** if the limit does not exist.

___1. $\lim_{x\to a} g(x) + h(x)$
___2. $\lim_{x\to a} g(x) - h(x)$
___3. $\lim_{x\to a} g(x) \cdot f(x)$
___4. $\lim_{x\to a} \frac{g(x)}{h(x)}$
___5. $\lim_{x\to a} \frac{g(x)}{f(x)}$
___6. $\lim_{x\to a} \frac{f(x)}{g(x)}$
___7. $\lim_{x\to a} (h(x))^2$
___8. $\lim_{x\to a} \frac{1}{h(x)}$
___9. $\lim_{x\to a} \frac{1}{h(x) - f(x)}$

Answer(s) submitted:

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(incorrect)

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2. (1 point) $\lim_{x\to 3} \dfrac{x^2 - 2x - 3}{\sqrt{x+1} - 2} =$ __________

Answer(s) submitted:

-

(incorrect)

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3. (1 point) $\lim_{x\to -\infty} \dfrac{2x}{14x^2 + 14x + 11} =$ __________

Answer(s) submitted:

-

(incorrect)

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4. (1 point) Let $f(x) = \dfrac{x}{|x|}$, where $x \neq 0$.

(a) Find $\lim_{x\to 0^+} f(x)$
Ans: __________
(b) Find $\lim_{x\to 0^-} f(x)$
Ans: __________
(c) Does $\lim_{x\to 0} f(x)$ exist?
Ans: __________

Answer(s) submitted:

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(incorrect)

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5. (1 point) Let $f(x)$ be defined by

$$f(x) = \begin{cases} e^{-12/x}, & \text{if } x > 0 \\ 17, & \text{if } x = 0 \\ \sin(24x), & \text{if } x < 0 \end{cases}$$

(a) Find $\lim_{x\to 0^+} f(x)$
Ans:__________
(b) Find $\lim_{x\to 0^-} f(x)$
Ans:__________
(c) Find $f(0)$
Ans:__________
(d) Does $\lim_{x\to 0} f(x)$ exist?
Ans: __________

Answer(s) submitted:

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(incorrect)

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6. (1 point) Find (without using differentiation), the limit $\lim_{x\to 0} \frac{\tan(5x)}{\tan(7x)}$
Ans: __________
(Hint: one of the special limits may be useful!)

Answer(s) submitted:

-

(incorrect)

7. (1 point) Using some well-known special limit, $\lim_{x\to\infty}\left(1+\frac{2}{x}\right)^{3x} =$ ______

Answer(s) submitted:

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(incorrect)

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8. (1 point) Evaluate $\lim_{x\to\infty}\left(\frac{x+6}{x+7}\right)^{x}$.

Answer = ______

Answer(s) submitted:

-

(incorrect)

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9. (1 point)

Evaluate the limit:

$\lim_{t\to 0}\frac{1-\cos 2t}{\sin 5t} =$ ___

Answer(s) submitted:

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(incorrect)

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10. (1 point) Evaluate

$$\lim_{\theta\to 0}\frac{\sin(4\cos\theta)}{4\sec\theta}.$$

Limit = ______

Answer(s) submitted:

-

(incorrect)

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11. (1 point)

Determine the limit of the sequence or show that the sequence diverges by using the appropriate Limit Laws or theorems. If the sequence diverges, enter DIV as your answer.

$$c_n = \ln\left(\frac{6n-7}{11n+4}\right)$$

$\lim_{n\to\infty} c_n =$ ______

Answer(s) submitted:

-

(incorrect)

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12. (1 point)

Consider the sequence

$$a_n = \frac{n\cos(n\pi)}{2n-1}.$$

Write the first five terms of a_n, and find $\lim_{n\to\infty} a_n$. If the sequence diverges, enter "divergent" in the answer box for its limit.

a) First five terms: ____, ____, ____, ____, ____.

b) $\lim_{n\to\infty} a_n =$ ______________.

Answer(s) submitted:

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(incorrect)

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13. (1 point) $\lim_{n\to\infty}\frac{\sin(4n)+(-1)^n\cos(n)}{\ln(4n)} =$ ______

Answer(s) submitted:

-

(incorrect)

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14. (1 point)

Put the following statements in order to justify why $\lim_{n\to\infty}\frac{6+7n-6n^2}{5n^2-4n+6} = -\frac{6}{5}$.

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0. $= \dfrac{\lim_{n\to\infty}(-6)+7\lim_{n\to\infty}\left(\frac{1}{n}\right)+6\lim_{n\to\infty}\left(\frac{1}{n^2}\right)}{\lim_{n\to\infty}(5)-4\lim_{n\to\infty}\left(\frac{1}{n}\right)+6\lim_{n\to\infty}\left(\frac{1}{n^2}\right)}$
1. $= \lim_{n\to\infty}\dfrac{n^2\left(\frac{7}{n}-6+\frac{6}{n^2}\right)}{n^2\left(5-\frac{4}{n}+\frac{6}{n^2}\right)}.$
2. $\lim_{n\to\infty}\dfrac{6+7n-6n^2}{5n^2-4n+6}.$
3. $= -\dfrac{6}{5}.$
4. $= \dfrac{-6+7\cdot 0+6\cdot 0}{5-4\cdot 0+6\cdot 0}$
5. $= \lim_{n\to\infty}\dfrac{\frac{7}{n}-6+\frac{6}{n^2}}{5-\frac{4}{n}+\frac{6}{n^2}}.$
6. $= \dfrac{\lim_{n\to\infty}\left(\frac{7}{n}-6+\frac{6}{n^2}\right)}{\lim_{n\to\infty}\left(5-\frac{4}{n}+\frac{6}{n^2}\right)}.$

Answer(s) submitted:

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(incorrect)

15. (1 point)

Put the following statements in order to justify why $\lim_{n\to\infty} \frac{-5n}{\sqrt{3n^2+1}} = \frac{-5}{\sqrt{3}}$.

0. $= \lim_{n\to\infty} \frac{n\cdot -5}{\sqrt{n^2}\cdot\sqrt{3+1/n^2}}$
1. $= \frac{\lim_{n\to\infty} -5}{\sqrt{\lim_{n\to\infty}(3)+\lim_{n\to\infty}(1/n^2)}}$
2. $= \lim_{n\to\infty} \frac{-5}{\sqrt{3+1/n^2}}$
3. $\lim_{n\to\infty} \frac{-5n}{\sqrt{3n^2+1}}$
4. $= \frac{-5}{\sqrt{3+0}}$
5. $= \frac{\lim_{n\to\infty} -5}{\lim_{n\to\infty}\sqrt{3+1/n^2}}$
6. $= \frac{-5}{\sqrt{3}}$.
7. $= \lim_{n\to\infty} \frac{-5n}{\sqrt{n^2(3+1/n^2)}}$

Answer(s) submitted:

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(incorrect)