1. (1 pt)
A function is said to have a **vertical asymptote** wherever the limit on the left or right (or both) is either positive or negative infinity.
For example, the function $f(x) = \frac{x^2-4}{(x-3)^2}$ has a vertical asymptote at $x = 3$.

For each of the following limits, enter either 'P' for positive infinity, 'N' for negative infinity, or 'D' when the limit simply does not exist.
$\lim_{x\to 3^-} \frac{x^2-4}{(x-3)^2} =$___
$\lim_{x\to 3^+} \frac{x^2-4}{(x-3)^2} =$___
$\lim_{x\to 3} \frac{x^2-4}{(x-3)^2} =$ ___

Answer(s) submitted:

- P
- P
- P

(correct)
Correct Answers:

- P
- P
- P

2. (1 pt)
Evaluate the following limits. If needed, enter INF for ∞ and MINF for $-\infty$.
(a)

$$\lim_{x\to\infty} \frac{4+4x}{2-10x} =$$

(b)

$$\lim_{x\to-\infty} \frac{4+4x}{2-10x} =$$

Answer(s) submitted:

- -2/5
- -2/5

(correct)
Correct Answers:

- -0.4
- -0.4

3. (1 pt)
Evaluate the following limits. If needed, enter INF for ∞ and MINF for $-\infty$.
(a)

$$\lim_{x\to\infty} \frac{9x^3-2x^2-6x}{11-7x-4x^3} =$$

(b)

$$\lim_{x\to-\infty} \frac{9x^3-2x^2-6x}{11-7x-4x^3} =$$

Answer(s) submitted:

- -9/4
- -9/4

(correct)
Correct Answers:

- -2.25
- -2.25

4. (1 pt)
Evaluate the following limits. If needed, enter INF for ∞ and MINF for $-\infty$.
(a)

$$\lim_{x\to\infty} \frac{11x+2}{3x^2-6x+3}$$

(b)

$$\lim_{x\to-\infty} \frac{11x+2}{3x^2-6x+3}$$

Answer(s) submitted:

- 0
- 0

(correct)
Correct Answers:

- 0
- 0

5. (1 pt)
Evaluate the following limits. If needed, enter INF for ∞ and MINF for $-\infty$.
(a)

$$\lim_{x\to\infty} \frac{(2-x)(6+9x)}{(3-4x)(4+2x)} =$$

(b)

$$\lim_{x\to-\infty} \frac{(2-x)(6+9x)}{(3-4x)(4+2x)} =$$

Answer(s) submitted:

- 9/8
- 9/8

(correct)
Correct Answers:

- 1.125
- 1.125

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6. (1 pt)
Evaluate the following limits. If needed, enter INF for ∞ and MINF for $-\infty$.
(a)

$$\lim_{x\to\infty} \frac{\sqrt{8+3x^2}}{3+2x} =$$

_____
(b)

$$\lim_{x\to-\infty} \frac{\sqrt{8+3x^2}}{3+2x} =$$

_____
Answer(s) submitted:

- sqrt(3)/2
- -sqrt(3)/2

(correct)
Correct Answers:

- 0.866025403784439
- -0.866025403784439

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7. (1 pt) Evaluate

$$\lim_{x\to\infty} (\sqrt{25x^2+x}-5x).$$

Enter **I** for ∞, **-I** for $-\infty$, and **DNE** if the limit does not exist.
Limit = _____

Answer(s) submitted:

- 1/10

(correct)
Correct Answers:

- 0.1

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8. (1 pt) Evaluate the limit

$$\lim_{x\to\infty} \sqrt{x^2+3}-\sqrt{x^2-3}$$

Answer: _____
Answer(s) submitted:

- 0

(correct)
Correct Answers:

- 0

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9. (1 pt) Evaluate

$$\lim_{x\to\infty} 7\cos x$$

Answer: _____
Note: Input *inf* for ∞, *-inf* for $-\infty$ or *dne* if needed.
Answer(s) submitted:

- DNE

(correct)
Correct Answers:

- dne

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10. (1 pt)
Evaluate the following limits. If needed, enter 'INF' for ∞ and '-INF' for $-\infty$.
(a)

$$\lim_{x\to\infty} \left(-18x^2+32x^3\right) =$$

_____
(b)

$$\lim_{x\to-\infty} \left(-18x^2+32x^3\right) =$$

_____
Answer(s) submitted:

- INF
- -INF

(correct)
Correct Answers:

- INF
- -INF

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11. (1 pt) Evaluate the following limit

$$\lim_{x\to\infty} \frac{3-\sqrt{x}}{3+\sqrt{x}}$$

Answer: _____
Answer(s) submitted:

- -1

(correct)
Correct Answers:

- -1

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12. (1 pt) Evaluate the following limits. If needed, enter *inf* for ∞ and *-inf* $-\infty$.

(a) $\lim_{x\to\infty} x^2(-4+2x)(7-2x) =$ _____

(b) $\lim_{x\to-\infty} x^2(-4+2x)(7-2x) =$ _____
Answer(s) submitted:

- -inf
- -inf

(correct)
Correct Answers:

- -inf
- -inf

13. (1 pt) Let

$$f(x) = \frac{x^2 + x - 12}{3x^2 + 9x - 12}.$$

Find the equations of the horizontal asymptotes and the vertical asymptotes of $f(x)$. If there are no asymptotes of a given type, enter *NONE* . If there is more than one asymptote of a given type, give a comma seperated list (i.e.: 1, 2,...).

Horizontal asymptotes: $y =$ _____

Vertical Asymptotes: $x =$ _____

Answer(s) submitted:

- `1/3`
- `1`

(correct)

Correct Answers:

- `0.333333333333333`
- `1`

14. (1 pt) Evaluate the following limits:

1. $\lim_{x \to 3^+} \frac{2}{x-3}$ = _____
2. $\lim_{x \to 5} \frac{2}{(x-5)^6}$ = _____
3. $\lim_{x \to -7^-} \frac{1}{x^2(x+7)}$ = _____
4. $\lim_{x \to 3^-} \frac{2}{x-3}$ = _____

Answer(s) submitted:

- `infinity`
- `infinity`
- `-infinity`
- `-infinity`

(correct)

Correct Answers:

- `infinity`
- `infinity`
- `-infinity`
- `-infinity`