Math Sheet

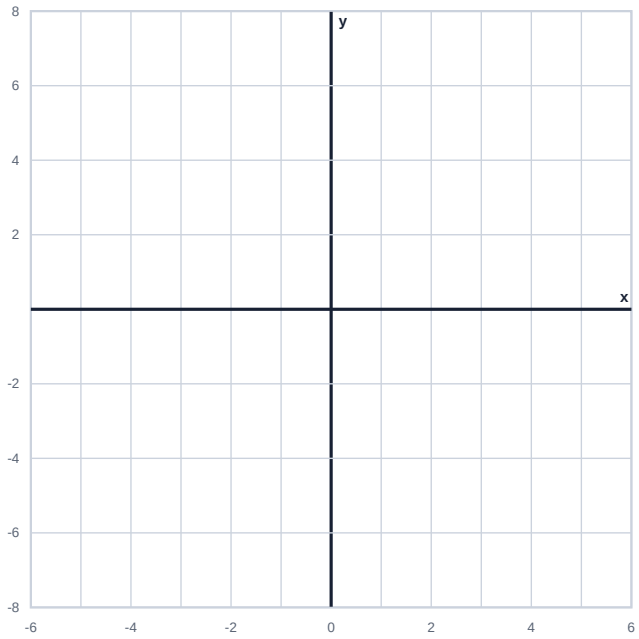
Name _____ Score _____ Teacher _____ Date _____

Evaluating Limits at Infinity with Graphs

Use each equation and blank coordinate grid to sketch the function, then evaluate the specified limit exactly.

1. Evaluate as x -> -infinity.

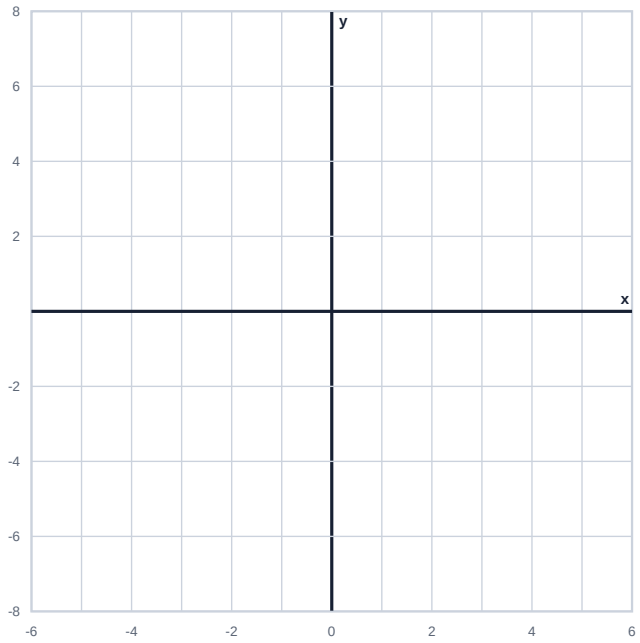
$f(x) = \frac{-1}{x - 2}$



Exact limit: _____

2. Evaluate as x -> +infinity.

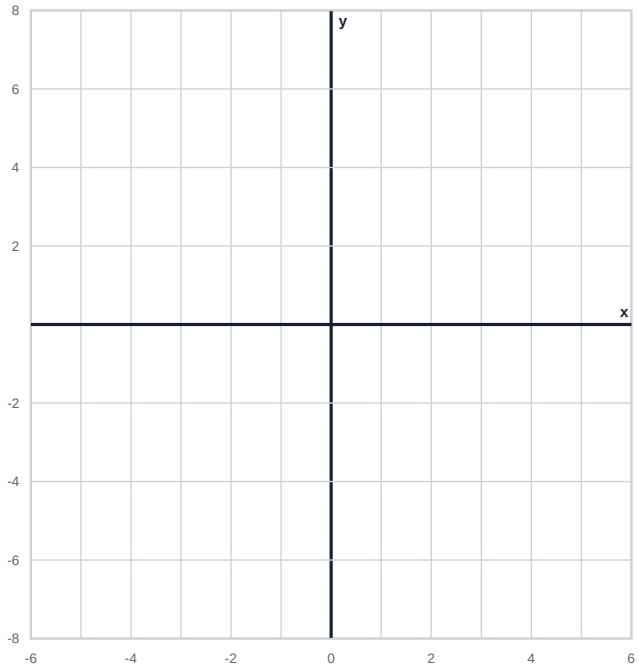
$f(x) = -1 + \frac{1}{2} \cdot (3)^{-x+1}$



Exact limit: _____

3. Evaluate as x -> +infinity.

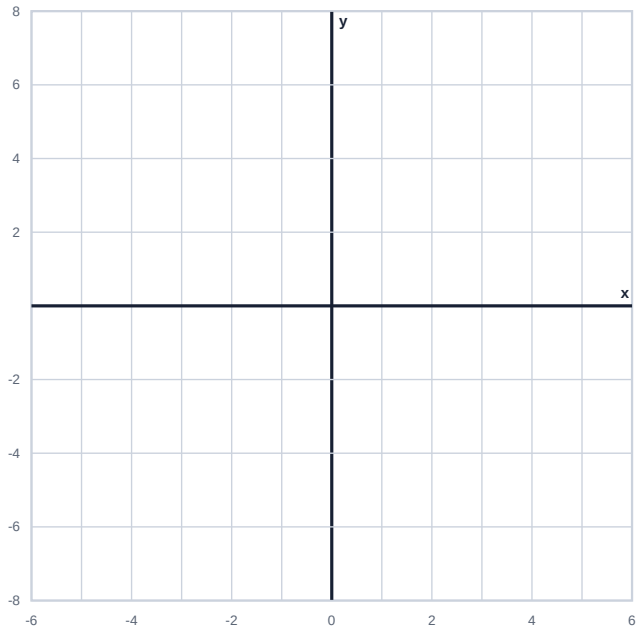
$f(x) = 2 \cdot x - 1$



Exact limit: _____

4. Evaluate as x -> +infinity.

$f(x) = \frac{-1}{x^2 + 4 \cdot x + 4}$



Exact limit: _____

Graph arrows show continuation beyond the viewing window.

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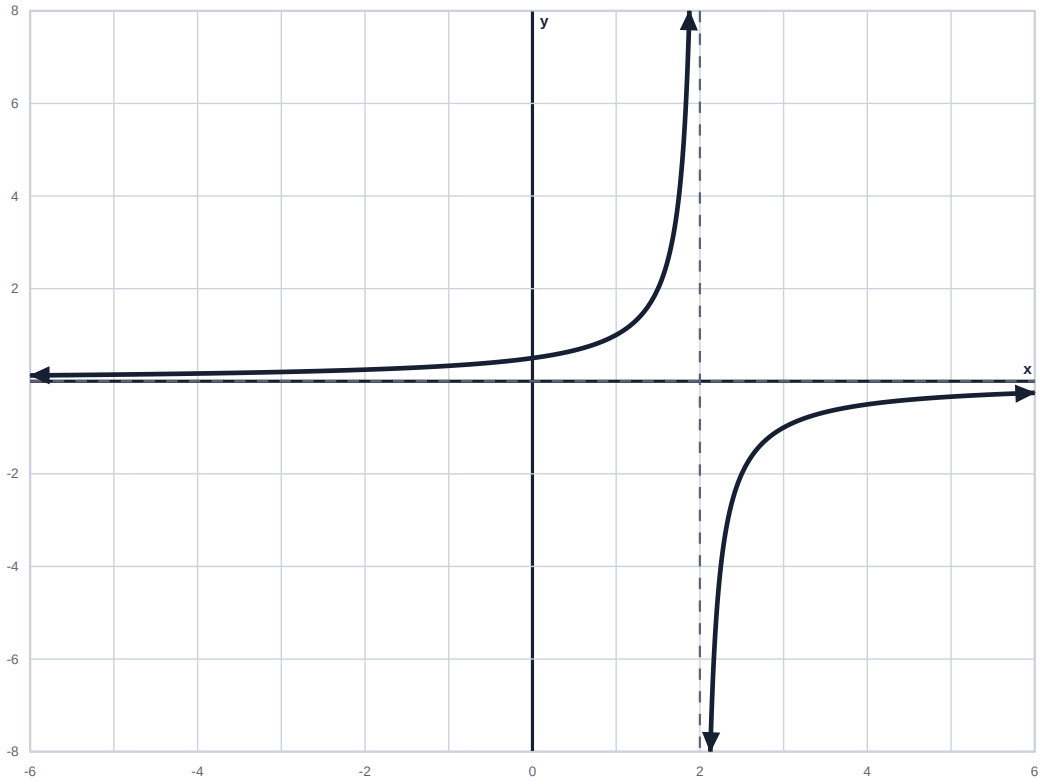
Evaluating Limits at Infinity with Graphs

Worked Answer Key

Use each equation and blank coordinate grid to sketch the function, then evaluate the specified limit exactly.

1. Completed graph; x -> -infinity

$$f(x) = \frac{-1}{x - 2}$$



Real domain: (-infinity, 2) union (2, +infinity). Exclusions: x=2 (pole).

Compare numerator and denominator degrees 0 and 1; the leading ratio is -1.

Exact limit as x -> -infinity = 0

Graph arrows show continuation beyond the viewing window.

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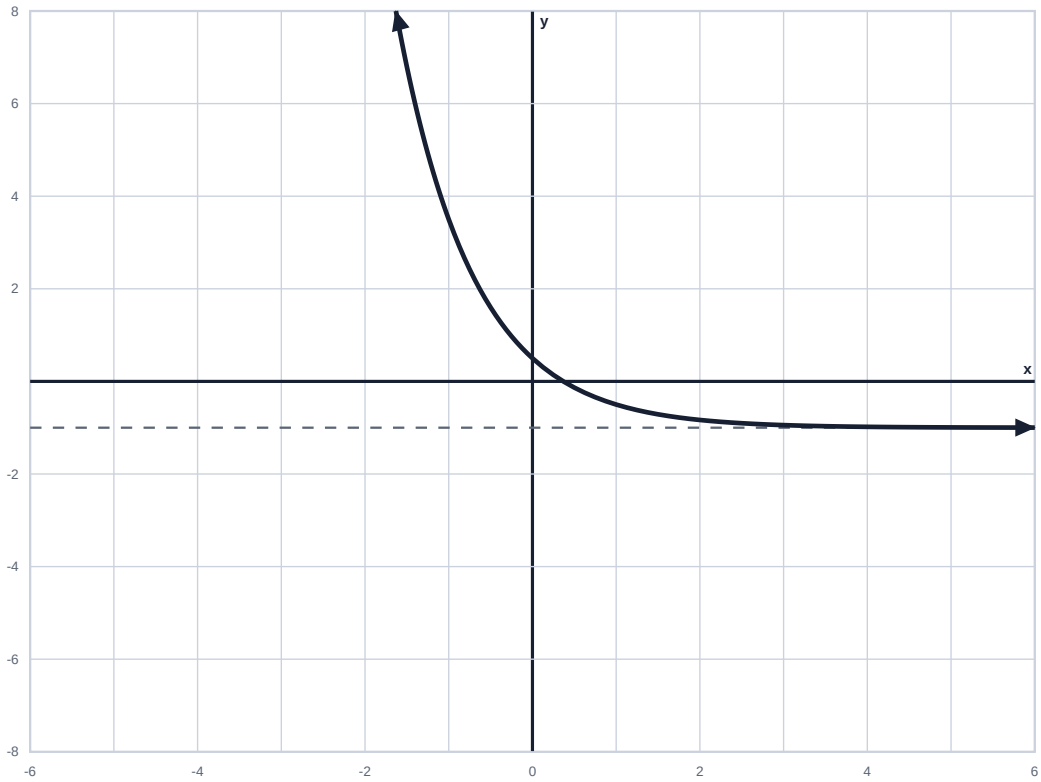
Evaluating Limits at Infinity with Graphs

Worked Answer Key

Use each equation and blank coordinate grid to sketch the function, then evaluate the specified limit exactly.

2. Completed graph; x -> +infinity

$f(x) = -1 + \frac{1}{2} \cdot (3)^{-x+1}$



Real domain: (-infinity, +infinity).

The exponent rate makes the exponential tend to 0 on this tail.

Exact limit as x -> +infinity = -1

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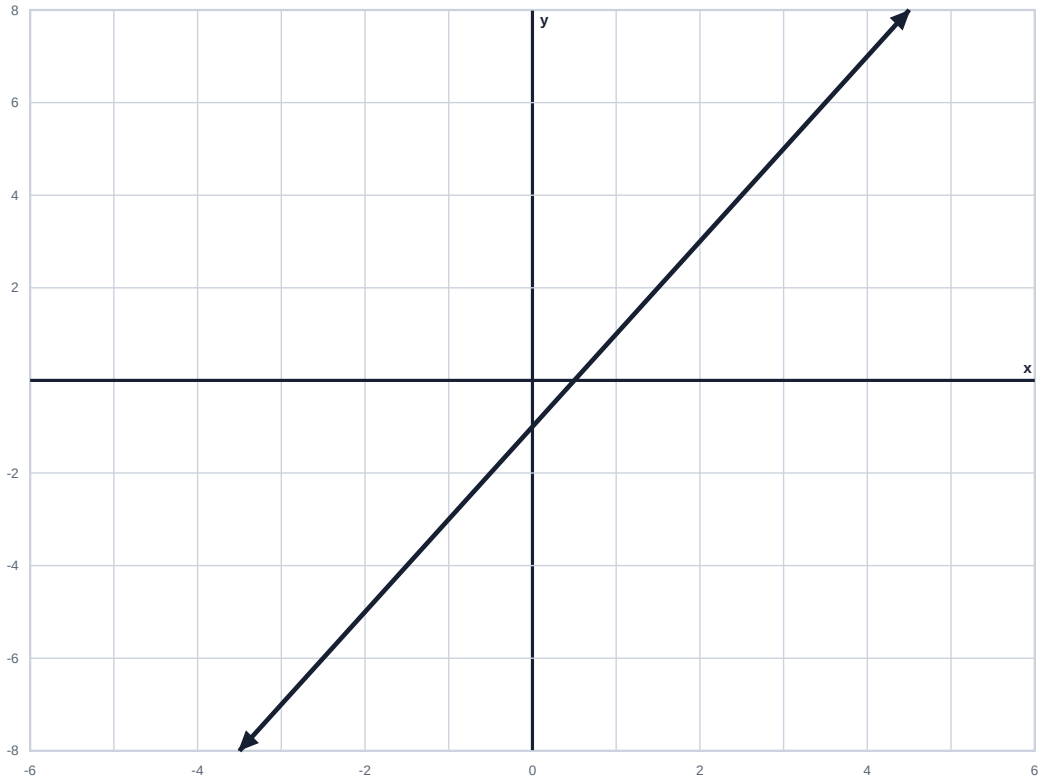
Evaluating Limits at Infinity with Graphs

Worked Answer Key

Use each equation and blank coordinate grid to sketch the function, then evaluate the specified limit exactly.

3. Completed graph; x -> +infinity

f(x) = 2·x - 1



Real domain: (-infinity, +infinity).

The degree-1 leading term controls the tail, including the direction sign.

Exact limit as x -> +infinity = +infinity

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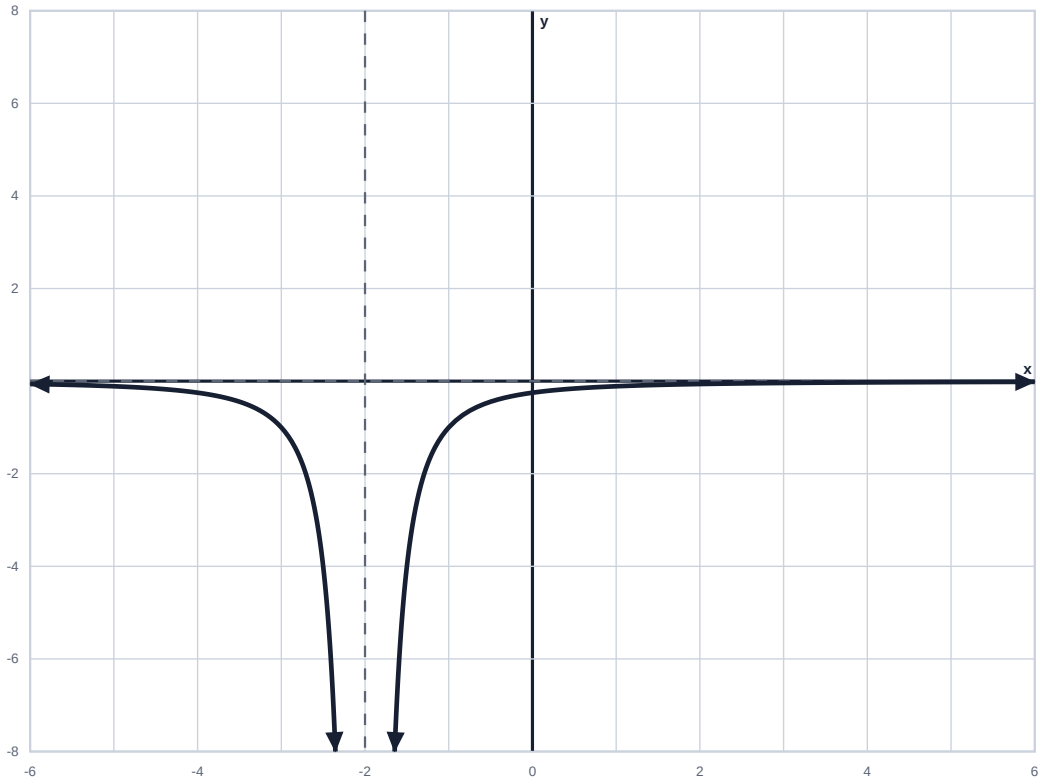
Evaluating Limits at Infinity with Graphs

Worked Answer Key

Use each equation and blank coordinate grid to sketch the function, then evaluate the specified limit exactly.

4. Completed graph; x -> +infinity

$$f(x) = \frac{-1}{x^2 + 4 \cdot x + 4}$$



Real domain: (-infinity, -2) union (-2, +infinity). Exclusions: x=-2 (pole).

Compare numerator and denominator degrees 0 and 2; the leading ratio is -1.

Exact limit as x -> +infinity = 0

Graph arrows show continuation beyond the viewing window.