

## Limits Values and Rates



Name: \_\_\_\_\_ Date: \_\_\_\_\_

Use the material to work through each task. Show the requested response.

**Approach and value**

For  $x$  not equal to 1,  $f(x) = (x^2 - 1)/(x - 1)$  equals  $x + 1$ . As  $x$  approaches 1,  $f(x)$  approaches 2, even if  $f(1)$  is undefined.

1. Simplify  $f(x)$  and state the excluded  $x$  value.

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2. Find the limit of  $f(x)$  as  $x$  approaches 1.

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3. Is  $f(1)$  defined by the original formula?

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4. Find the limit of  $x^2$  as  $x$  approaches 3.

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5. Find the average rate of change of  $x^2$  from  $x = 2$  to  $x = 3$ .

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6. Explain why an undefined function value does not always mean the limit is absent.

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