

Algebra / Evaluating a piecewise-defined function

TimelyMathTutor Video:

ALEKS | Evaluating a piecewise-defined function



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Worked Examples:

Evaluating a piecewise-defined function

Suppose that the function h is defined, for all real numbers, as follows.

$$h(x) = \begin{cases} \frac{1}{4}x - 2 & \text{if } x \leq -1 \\ -(x-1)^2 + 2 & \text{if } -1 < x \leq 2 \\ -\frac{1}{4}x - 2 & \text{if } x > 2 \end{cases}$$

Find $h(-3)$, $h(0)$, and $h(2)$.

$h(-3) =$ $h(0) =$ $h(2) =$

Handwritten solutions:

$h(-3) = \frac{1}{4}(-3) - 2$
 $x = -3 \quad = -\frac{3}{4} - \frac{8}{4} = \boxed{-\frac{11}{4}}$

$h(0) = -(0-1)^2 + 2$
 $x = 0 \quad = -(-1)^2 + 2$
 $\quad = -1 + 2 = \boxed{1}$

$h(2) = -(2-1)^2 + 2$
 $x = 2 \quad = -(1)^2 + 2$
 $\quad = -1 + 2 = \boxed{1}$

Note: The Solve feature is not available to students.

Explanation Try Another Check Solve

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Evaluating a piecewise-defined function

Suppose that the function f is defined, for all real numbers, as follows.

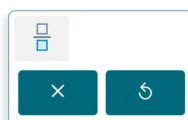
$$f(x) = \begin{cases} -\frac{1}{2}x^2 + 4 & \text{if } x \neq -2 \\ 3 & \text{if } x = -2 \end{cases}$$

Find $f(-5)$, $f(-2)$, and $f(0)$.

$f(-5) =$

$f(-2) =$

$f(0) =$



$f(-5) = -\frac{1}{2}(-5)^2 + 4$
 $x = -5 \quad = -\frac{1}{2}(25) + 4$
 $\quad = -\frac{25}{2} + \frac{8}{2} = \boxed{-\frac{17}{2}}$

$f(-2) = \boxed{3}$
 $x = -2$

$f(0) = -\frac{1}{2}(0)^2 + 4$
 $x = 0 \quad \boxed{4}$

Evaluating a piecewise-defined function

Suppose that the function f is defined, for all real numbers, as follows.

$$f(x) = \begin{cases} -\frac{1}{2}x^2 + 4 & \text{if } x \neq -2 \\ 3 & \text{if } x = -2 \end{cases}$$

$f(-5) =$ $f(-2) =$ $f(0) =$

Handwritten solutions:

$f(-5) = -\frac{1}{2}(-5)^2 + 4$

$f(x) = \begin{cases} 4 & \text{if } x < -2 \\ -1 & \text{if } x = -2 \end{cases}$
 Find $f(-4)$, $f(-2)$, and $f(1)$.

$f(-4) =$
 $f(-2) =$
 $f(1) =$

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

$f(1) = -\frac{1}{4}(1)^2 + 4$
 $x = 1$
 $-\frac{1}{4} + 4 = 3\frac{3}{4}$

$f(-4) = -4 + 4 = 0$

Note: The Solve feature is not available to students.

Explanation Try Another Check Solve

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Evaluating a piecewise-defined function
 Suppose that the function g is defined, for all real numbers, as follows.

$g(x) = \begin{cases} 4 & \text{if } x < -2 \\ -(x+1)^2 + 3 & \text{if } -2 \leq x \leq 1 \\ -\frac{1}{2}x - 1 & \text{if } x > 1 \end{cases}$

Find $g(-2)$, $g(-1)$, and $g(3)$.

$g(-2) =$
 $g(-1) =$
 $g(3) =$

$g(-2) = -(-2+1)^2 + 3$
 $x = -2$
 $-(-1)^2 + 3 = -1 + 3 = 2$

$g(-1) = -(-1+1)^2 + 3$
 $x = -1$
 $-0 + 3 = 3$

$g(3) = -\frac{1}{2}(3) - 1$
 $x = 3$
 $-\frac{3}{2} - 1 = -2.5$
 $-\frac{3}{2} - \frac{1}{2} = -\frac{4}{2} = -2$

Note: The Solve feature is not available to students.

Explanation Try Another Check Solve

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#GraphsAndFunctions

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