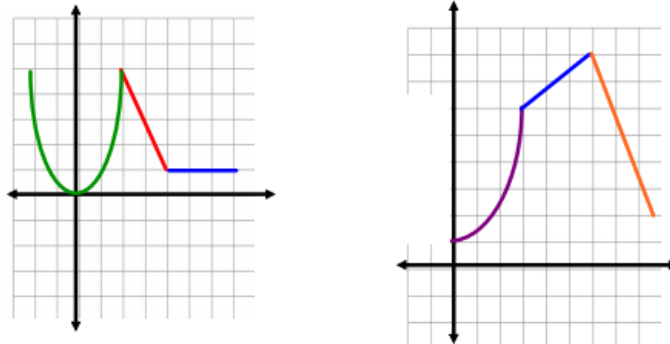


Piecewise Functions

(2 or more functions on same graph)

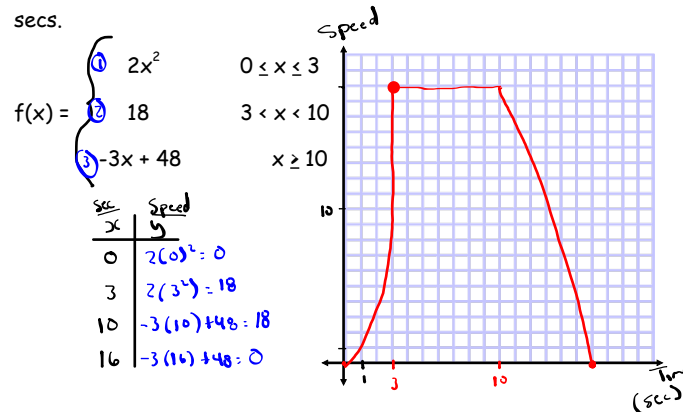


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Piecewise function:

is a function made up of two or more functions, each defined within a specific interval of the domain (ie x-value).

Ex. A car's speed between two stops is defined by the following function in which $f(x)$ is the speed in m/sec, and x is the time in secs.



At what times was the car moving at 12 m/s?

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Ex. The temperature outdoors is tracked over the course of 10 hours. Describe the function over:

1) the first 3 hours? 2) between 3 and 6 hours 3) between 6-10 hours

$$f(x) = \begin{cases} x + 3 & 0 \leq x \leq 3 \\ 6 & 3 \leq x \leq 6 \\ -1.5x + 15 & 6 \leq x \leq 10 \end{cases}$$

① $y = ax + b$ $(x_1, y_1) = (0, 3)$ $(x_2, y_2) = (3, 6)$
 $a = \frac{y_2 - y_1}{x_2 - x_1} = \frac{6 - 3}{3 - 0} = \frac{3}{3} = 1$ $y = x + 3$

② $y = b$ $y = 6$

③ $y = ax + b$ $(x_1, y_1) = (6, 6)$ $(x_2, y_2) = (10, 0)$
 $a = \frac{0 - 6}{10 - 6} = \frac{-6}{4} = \frac{-3}{2} = -1.5$
 $6 = -1.5(6) + b$
 $6 = -9 + b$
 $+9 \rightarrow 15 = b$
 $y = -1.5x + 15$

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Ex. The temperature outside varies according to the following piecewise function:

$$g(x) = \begin{cases} ① x^2 & -4 \leq x \leq 0 \\ ② 3x & 0 < x \leq 2 \\ ③ 6 & 2 < x \leq 8 \end{cases}$$

x	y
-4	$(-4)^2 = 16$
0	$(0)^2 = 0$
2	$3(2) = 6$
8	6
-2	$(-2)^2 = 4$

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Ex. You decide to hire some painters to paint your house. The price they charge varies according to a piecewise function $h(x)$ depending on how many hours they need to work, represented by x .

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Homework

Handout: Piecewise Function

#1 - 4

Feb 26-2:42 PM