

LESSON 5.3 Skills Practice

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Connecting Pieces
Piecewise Functions

Vocabulary

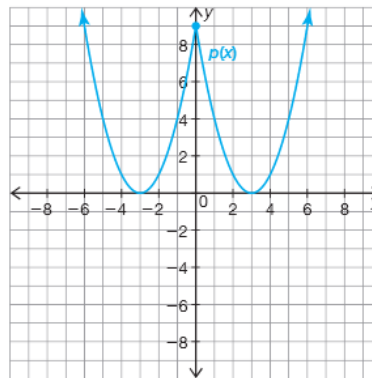
Write a definition for the term in your own words.

1. piecewise function

Problem Set

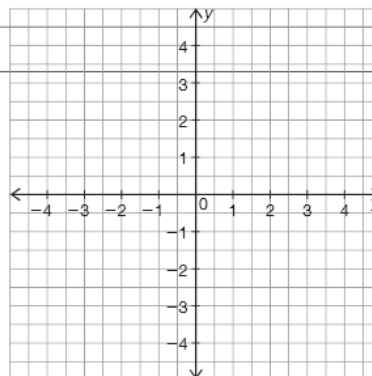
Sketch each piecewise function on the coordinate plane.

1.
$$p(x) = \begin{cases} (x + 3)^2, & x < 0 \\ (x - 3)^2, & x \geq 0 \end{cases}$$



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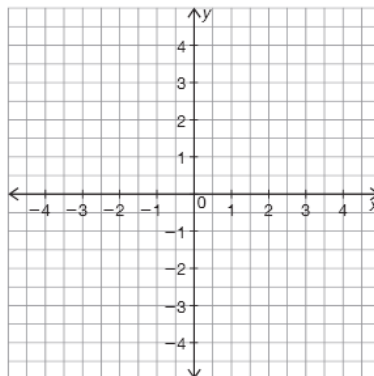
2.
$$b(x) = \begin{cases} \frac{1}{4}x^2, & x \leq 2 \\ -\frac{1}{2}(x - 2)^2, & x > 2 \end{cases}$$



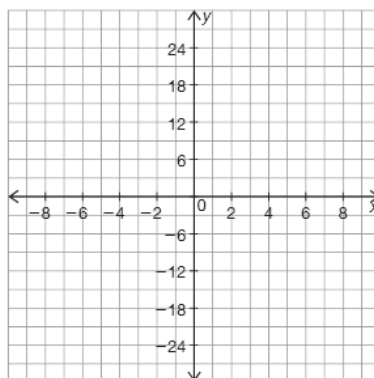
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$$3. f(x) = \begin{cases} -x + 1, & x < 0 \\ (x - 2)^2 - 3, & 0 \leq x \leq 2 \\ -3, & x > 2 \end{cases}$$

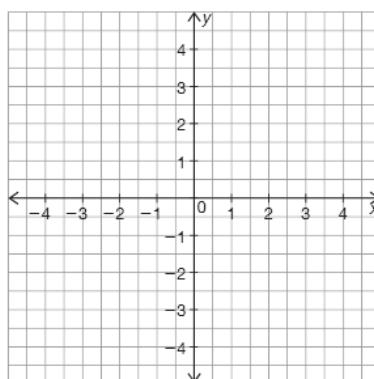


$$4. g(x) = \begin{cases} 2x + 12, & x < -3 \\ -x^2 + 9x^2, & -3 \leq x \leq 3 \\ 7x - 42, & x > 3 \end{cases}$$



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$$5. t(x) = \begin{cases} -\frac{1}{4}(x - 2)^2 + 3, & x \leq 2 \\ -2x + 4, & x > 2 \end{cases}$$



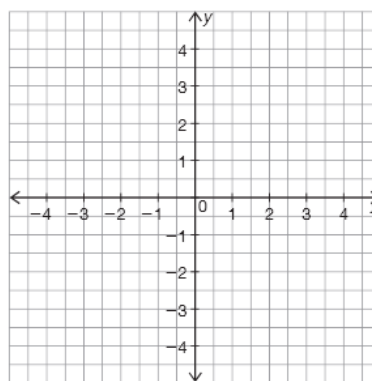
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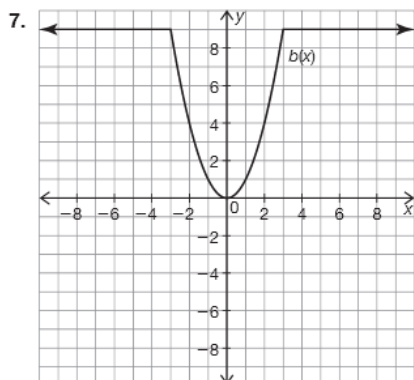
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$$6. m(x) = \begin{cases} x^2, & x \leq -1 \\ -x^2 + 3, & -1 < x \leq 1 \\ -x^2 + 4, & x > 1 \end{cases}$$



Write the equation of each piecewise function given its graph.

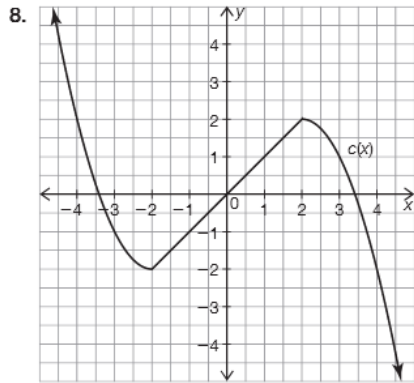


$$b(x) = \begin{cases} 9, & x < -3 \\ x^2, & -3 \leq x \leq 3 \\ 9, & x > 3 \end{cases}$$

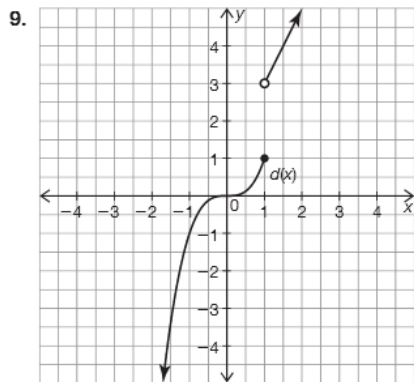
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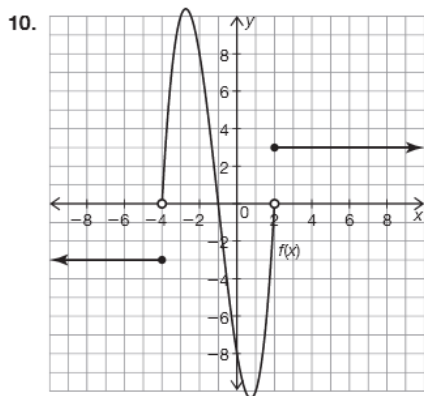


$c(x) =$



$d(x) =$

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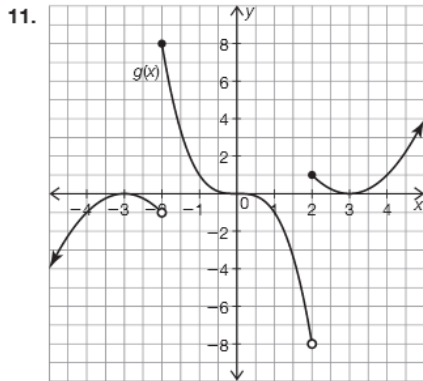
$f(x) =$

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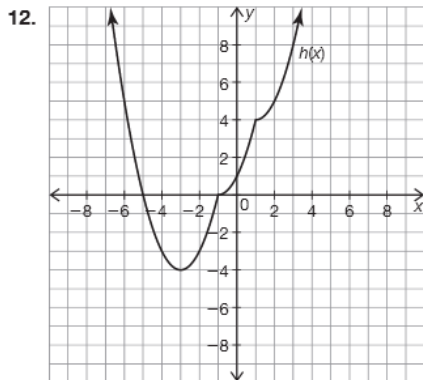
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$g(x) =$



$h(x) =$

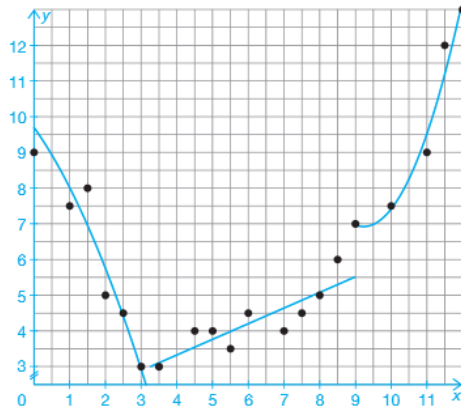
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Analyze the scatter plot. Determine a regression equation over each interval to write a piecewise function that models the data. Round decimals to the nearest thousandth. Then, graph the piecewise function on the scatter plot.

13.

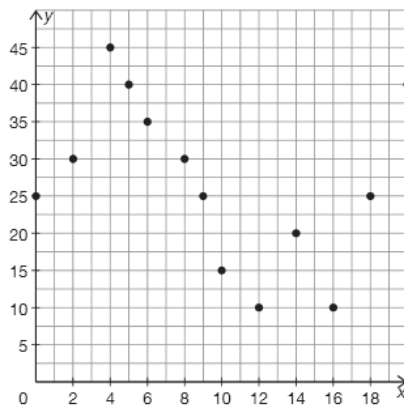


Answers will vary.

$$f(x) = \begin{cases} -0.286x^2 - 1.4x + 9.7, & 0.5 \leq x < 3.5 \\ 0.438x + 1.574, & 3.5 \leq x < 9 \\ 0.826x^2 - 15.245x + 77.265, & 9 \leq x \leq 12 \end{cases}$$

14.

5



$$f(x) = \begin{cases} \rule{10cm}{0.4pt}, & 0 \leq x \leq 3 \\ \rule{10cm}{0.4pt}, & 3 < x \leq 8 \\ \rule{10cm}{0.4pt}, & 8 < x \leq 20 \end{cases}$$

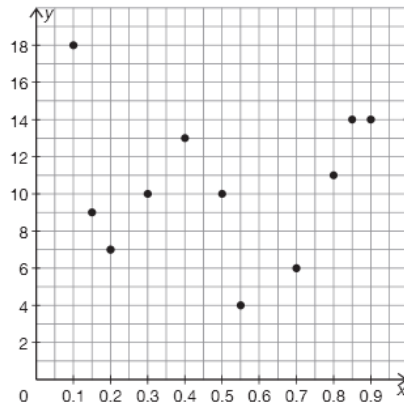
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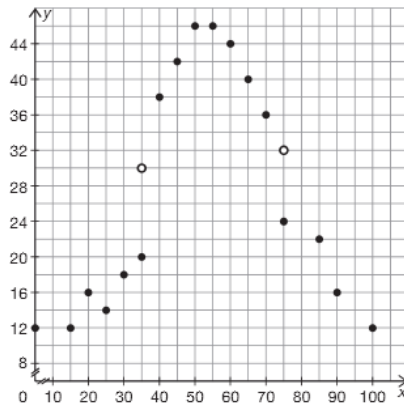
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15.



$$f(x) = \begin{cases} \text{_____}, & 0 < x \leq 0.5 \\ \text{_____}, & 0.5 < x \leq 0.8 \\ \text{_____}, & 0.8 < x \leq 1.0 \end{cases}$$

16.



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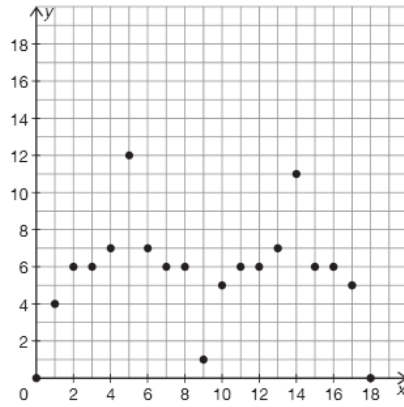
$$f(x) = \begin{cases} \text{_____}, & 10 \leq x \leq 35 \\ \text{_____}, & 35 < x \leq 75 \\ \text{_____}, & 75 < x \leq 110 \end{cases}$$

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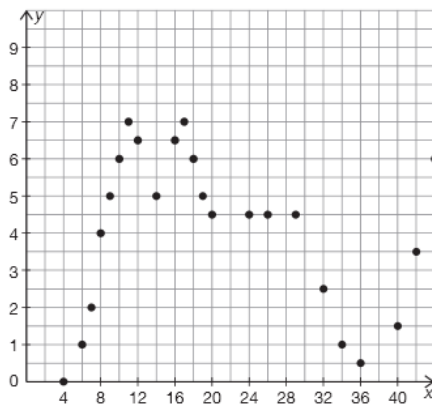
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17.



$$f(x) = \begin{cases} \rule{1.5cm}{0.4pt}, & 0 \leq x \leq 5 \\ \rule{1.5cm}{0.4pt}, & 5 < x \leq 9 \\ \rule{1.5cm}{0.4pt}, & 9 < x \leq 14 \\ \rule{1.5cm}{0.4pt}, & 14 < x \leq 18 \end{cases}$$

18.



$$f(x) = \begin{cases} \rule{1.5cm}{0.4pt}, & 4 \leq x < 8 \\ \rule{1.5cm}{0.4pt}, & 8 \leq x < 20 \\ \rule{1.5cm}{0.4pt}, & 20 \leq x < 32 \\ \rule{1.5cm}{0.4pt}, & 32 \leq x \leq 44 \end{cases}$$

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