

<p>MAFS.912.A-REI.4.11</p> <p>Also assesses MAFS.912.A-REI.4.10</p>	<p>Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately (e.g., using technology to graph the functions, make tables of values, or find successive approximations). Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.</p> <p>Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</p>
<p>Item Types</p>	<p>Equation Editor – May require creating a value, an equation, or an expression.</p> <p>GRID – May require identifying points where $f(x) = g(x)$.</p> <p>Hot Text – May require dragging labels to a graph or dragging and dropping numbers and symbols to complete a solution.</p> <p>Matching Item – May require choosing ordered pairs that are solutions of a function.</p> <p>Multiple Choice – May require selecting a value or an expression from a list.</p> <p>Multiselect – May require selecting multiple values.</p> <p>Open Response – May require creating a written response.</p> <p>Table Item – May require completing missing cells in a table.</p>
<p>Clarifications</p>	<p>Students will find a solution or an approximate solution for $f(x) = g(x)$ using a graph.</p> <p>Students will find a solution or an approximate solution for $f(x) = g(x)$ using a table of values.</p> <p>Students will find a solution or an approximate solution for $f(x) = g(x)$ using successive approximations that give the solution to a given place value.</p> <p>Students will justify why the intersection of two functions is a solution to $f(x) = g(x)$.</p> <p>Students will verify if a set of ordered pairs is a solution of a function.</p>
<p>Assessment Limits</p>	<p>In items where a function is represented by an equation, the function may be an exponential function with no more than one translation, a linear function, or a quadratic function.</p>

	In items where a function is represented by a graph or table, the function may be any continuous function.
Stimulus Attributes	<p>Items may be set in a mathematical or real-world context.</p> <p>Items may use function notation.</p> <p>Items must designate the place value accuracy necessary for approximate solutions.</p>
Response Attributes	<p>Items may require the student to complete a missing step in an algebraic justification of the solution of $f(x) = g(x)$.</p> <p>Items may require the student to explain the role of the x-coordinate and the y-coordinate in the intersection of $f(x) = g(x)$.</p> <p>Items may require the student to explain a process.</p> <p>Items may require the student to record successive approximations used to find the solution of $f(x) = g(x)$.</p>
Calculator	Neutral

Sample Item	Item Type																																	
Equation Editor																																		
<p>Cora is using successive approximations to estimate a positive solution to $f(x) = g(x)$, where $f(x) = x^2 + 13$ and $g(x) = 3x + 14$. The table shows her results for different input values of x.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>x</th> <th>$f(x)$</th> <th>$g(x)$</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>13</td> <td>14</td> </tr> <tr> <td>1</td> <td>14</td> <td>17</td> </tr> <tr> <td>2</td> <td>17</td> <td>20</td> </tr> <tr> <td>3</td> <td>22</td> <td>23</td> </tr> <tr> <td>4</td> <td>29</td> <td>26</td> </tr> <tr> <td>3.5</td> <td>25.25</td> <td>24.5</td> </tr> </tbody> </table> <p>Use Cora's process to find the positive solution, to the nearest tenth, of $f(x) = g(x)$.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <div style="border-bottom: 1px solid gray; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px solid gray; padding: 2px;"> <div style="border-bottom: 1px solid gray; margin-bottom: 2px;"> ← → ↶ ↷ ✖ </div> <table border="1" style="border-collapse: collapse; text-align: center;"> <tbody> <tr> <td>1</td><td>2</td><td>3</td> </tr> <tr> <td>4</td><td>5</td><td>6</td> </tr> <tr> <td>7</td><td>8</td><td>9</td> </tr> <tr> <td>0</td><td>.</td><td>-</td> </tr> </tbody> </table> </div> </div>		x	$f(x)$	$g(x)$	0	13	14	1	14	17	2	17	20	3	22	23	4	29	26	3.5	25.25	24.5	1	2	3	4	5	6	7	8	9	0	.	-
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