

# Introduction to Java

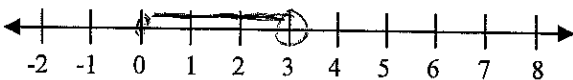
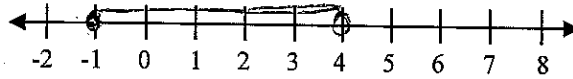
## Unit 2. Exercises

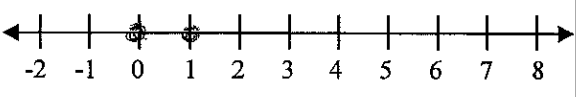
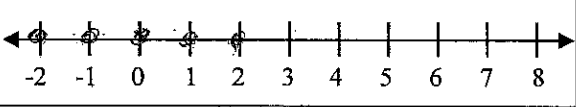
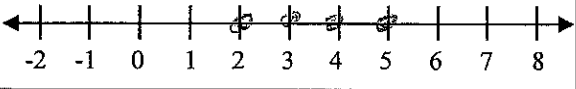
<p>Note: Curly brackets {} are optional if there is only one statement associated with the if (or else) statement.</p> <p>1. If the user enters 82, what is displayed? Bad Ok</p> <p>2. If the user enters 2, what is displayed? Good OK</p>	<pre>Scanner get = new Scanner(System.in); System.out.print( "Enter a number: " ); int x = get.nextInt();  if ( x &lt; 7 )     System.out.println( "Good" ); else     System.out.println( "Bad" );  if ( x &gt; 0 )     System.out.println( "Ok" );</pre>
<p>3. If the user enters 10, what is displayed? AA BB CC</p> <p>4. If the user enters 12, what is displayed? AA CC</p>	<pre>Scanner get = new Scanner(System.in); System.out.print( "Enter a number: " ); int x = get.nextInt();  System.out.println( "AA" ); if ( x &lt;= 11 ) {     System.out.println( "BB" ); } System.out.println( "CC" );</pre>
<p>5. If the user enters 10, what is displayed? x <input checked="" type="checkbox"/> 30 30</p> <p>6. If the user enters 4, what is displayed? x <input checked="" type="checkbox"/> 29 29</p> <p>7. If the user enters 2, what is displayed? x <input checked="" type="checkbox"/> 37 37</p>	<pre>Scanner get = new Scanner(System.in); System.out.print( "Enter a number: " ); int x = get.nextInt();  if ( x != 10 )     x = x + 5;  if ( x &gt; 7 )     x = x + 20; else     x = x + 30;  System.out.println( x );</pre>
<p>8. If x has an initial value of 33, what is its final value? x <input checked="" type="checkbox"/> 33 39 39</p> <p>9. If x has an initial value of 62, what is its final value? x <input checked="" type="checkbox"/> 62 58 58</p>	<pre>// x is declared and assigned a value  if ( x &gt; 30 &amp;&amp; x &lt;= 50 ) {     x = x + 10; } x = x - 4; if ( x &lt; 40 &amp;&amp; x &gt; 60 )     x = x + 2;</pre> <p>can never happen!</p>

<p>10. If x has a value of -5 and y has a value of 63, what is displayed? G H K</p> <p>11. If x has a value of 47 and y has a value of 47, what is displayed?</p> <p>12. Select the TRUE statement. a) H is never printed. b) H is always printed. c) H is only printed sometimes.</p>	<p>// x and y are declared and initialized</p> <pre>if ( x &gt; 30    y &gt;= 60 )     System.out.println( "G" );  if ( x &lt; 100    x &gt; 40 )     System.out.println( "H" );  if ( y &lt; 10    y &gt; 50 )     System.out.println( "K" );</pre>
<p>13. If y has an initial value of 12, what is displayed? y   12   22 23   23</p> <p>14. If y has an initial value of 26, what is displayed? y   26   36 37   37</p> <p>15. If y has an initial value of 7, what is displayed? y   7   7</p>	<pre>Scanner x = new Scanner( System.in ); System.out.println( "Number?" ); int y = x.nextInt();  if ( y &gt; 10 )     y += 10;  if ( y &gt; 20 )     y++;  System.out.println( y );</pre>
<p>16. The code to the right does not compile. The "else" is highlighted and the error message is: 'else' without 'if' Why?</p> <p>17. Given that the above error is fixed by the addition of two characters, what will be displayed if the user enters 12? a   12   24   output: 24 24</p>	<pre>Scanner read = new Scanner( System.in ); System.out.println( "Number?" ); int a = read.nextInt();  if ( a &gt; 10 &amp;&amp; a &lt; 20 ) {     a = 2 * a;     System.out.println( a ); } else {     a--; }  System.out.println( a );</pre> <p>Block of code so need {} braces!</p>
<p>18. If x has an initial value of -8, what is its final value? x   -8   -6   -3</p> <p>19. If x has an initial value of 9, what is its final value? x   9   11   11</p>	<p>// x is declared and assigned a value</p> <pre>if ( x &gt; 10    x &lt; 20 )     x = x + 2;  if ( x &lt; 10    x &gt; 20 )     x = x + 3;</pre>
<p>20. If x has an initial value of 15, what is its final value? x   15   17   17</p> <p>21. If x has an initial value of 22, what is its final value? x   22   32   32</p> <p>22. If x has a final value of 6, what was its initial value? cannot happen</p>	<p>// x is declared and assigned a value</p> <pre>if ( x &gt; 10 &amp;&amp; x &lt; 20 )     x = x + 2;  if ( x &lt; 10 &amp;&amp; x &gt; 20 ) can't happen     x = x + 3;  if ( x &gt; 10 &amp;&amp; x &gt; 20 )     x = x + 10;</pre>

<p>Curly braces identify a "block of code." A variable that is declared within a block of code <u>cannot be used</u> outside of that block of code. For example. This code does not compile. The last statement will be highlighted and the compiler error is: cannot find symbol - variable a</p> <p>You won't be tested on this concept but you may run into this problem as you write your programs.</p>	<pre>Scanner scan = new Scanner( System.in ); System.out.println( "Number?" ); int x = scan.nextInt();  if ( x &gt; 10 ) {     int a = 4 * x;     System.out.println( a ); } System.out.println( a );</pre> <p style="text-align: right;">} Block of code.</p>
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<p>23. What is displayed?</p> <p style="text-align: center; font-size: 2em;">7.0</p>	<pre>int x = 49; double y = Math.sqrt( x ); System.out.println( y );</pre>
<p>24. This code does not compile. The error message is: <i>Type mismatch: cannot convert from double to int</i></p> <p>What is the problem?</p> <p><i>y holds an int but Math.sqrt returns a double. check 'java api Math</i></p>	<pre>int x = 49; int y = Math.sqrt( x ); System.out.println( y );</pre>
<p>25. What is the value of y?</p> <p style="text-align: center; font-size: 2em;">14</p>	<pre>int x = -14; int y = Math.abs( x );</pre>
<p>26. List three different numbers that will cause A to be displayed.</p> <p style="text-align: center;">49, 36, 25</p> <p style="text-align: center;"><i>any perfect square</i></p> <p>27. List three different numbers that will cause B to be displayed.</p> <p style="text-align: center;">50, 37, 26</p> <p style="text-align: center;"><i>any non-perfect square</i></p>	<pre>import java.util.Scanner;  public class Runner{     public static void main( String [] args ){         Scanner x = new Scanner( System.in );         System.out.println( "Enter a positive number" );         double num2 = x.nextDouble();         int num = (int) Math.sqrt( num2 );         if ( num*num == num2 )             System.out.println( "A" );         else             System.out.println( "B" );     } }</pre>

<p>28. Use the number line to show the possible values for <math>d</math>.</p> 	<pre>double d = 3 * Math.random();</pre> <p style="text-align: center;"><math>0.0 \leq x &lt; 1.0</math></p> <p style="text-align: center;"><math>0.0 \leq d &lt; 3.0</math></p>
<p>29. Use the number line to show the possible values for <math>d</math>.</p> 	<pre>double d = 5 * Math.random() - 1;</pre> <p style="text-align: center;"><math>0.0 \leq x &lt; 1.0</math></p> <p style="text-align: center;"><math>0.0 \leq x &lt; 5.0 - 1</math></p> <p style="text-align: center;"><math>-1 \leq x &lt; 4.0</math></p>

<p>30. Use the number line to show the possible values for x.</p> 	<pre>int x = (int) ( 2*Math.random() ); 0.0 ≤ x &lt; 2.0</pre> <p><math>x \in 0, 1</math> only integers</p>
<p>31. Use the number line to show the possible values for x.</p> 	<pre>int x = (int) ( 5 * Math.random() ) - 2;</pre> <p><math>0.0 \leq x &lt; 5.0</math> <math>0, 1, 2, 3, 4</math>    <math>-2, \dots</math> 2</p>
<p>32. Use the number line to show the possible values for x.</p> 	<pre>int x = (int) ( 4 * Math.random() ) + 2;</pre> <p><math>0.0 \leq x &lt; 4.0</math> <math>0, 1, 2, 3</math>    <math>2, \dots</math> 5</p>

or count from bottom # to top #.

<p>33. Complete the line of code so that n is assigned a random integer value within the following limits:</p> <p><math>7 \leq n \leq 15</math></p>	<pre>int n = (int) ( 9 * Math.random() ) + 7</pre> <p>range: max - min + 1 <math>15 - 7 + 1 = 9</math></p>
<p>34. Complete the line of code so that n is assigned a random integer value within the following limits:</p> <p><math>-4 \leq n \leq 8</math></p>	<pre>int n = (int) ( 13 * Math.random() ) - 4</pre> <p>range: max - min + 1 <math>8 - (-4) + 1 = 13</math></p>
<p>35. What integers may be printed?</p> <p><math>-5</math> or <math>-6</math></p>	<pre>int n = (int) ( 2 * Math.random() ) + 5; if ( Math.random() &lt; 0.5 )     n = -1 * n;</pre> <p><math>0.0 \leq x &lt; 2.0</math> <math>0 \leq x \leq 1</math> 5 or 6</p>
<p>36. What integers may be printed?</p> <p>integers 5 thru 20</p>	<pre>int n = (int) ( 4 * Math.random() ) + 1; n = 5 * n;</pre> <p><math>0, 1, 2, 3</math> <math>1, 2, 3, 4</math></p>

<p>37. If k has an initial value of 13, what is its final value?</p> <p>19</p> <p>38. If k has an initial value of 22, what is its final value?</p> <p>22</p> <p>39. If k has an initial value of 4, what is its final value?</p> <p>6</p>	<pre>// k is declared and assigned a value if ( k &lt; 5 )     k += 2; else if ( k &lt; 10 )     k += 5; else if ( k &lt; 20 )     k += 6;</pre>
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40. If k has an initial value of 10, what is its final value? k <del>10</del> 12	<pre>// k is declared and assigned a value 1 if ( k &lt; 11 ) 2     k += 4; 3 else if ( k &lt; 40 ) 4     k++; 5 if ( k &gt; 11 ) 6     k = k - 2; 7 else if ( k &gt; 22 ) 8     k -= 4;</pre>
41. If k has an initial value of 30, what is its final value? k <del>30</del> 29	
42. Lines 7 and 8 can be deleted without changing how the code runs. <input checked="" type="radio"/> TRUE <input type="radio"/> FALSE	

43. If num has a value of 0.2, what is displayed? AA	<pre>double num = Math.random(); if ( num &lt; 0.25 ) {     System.out.println( "AA" ); } else if ( num &lt; 0.5 ) {     System.out.println( "BB" ); } else {     System.out.println( "CC" ); }</pre>
44. If num has a value of 0.35, what is displayed? BB	
45. About what percent of the time will CC appear? 50%	

46. If the user enters 38, what is displayed? XX WW	<pre>Scanner read = new Scanner(System.in); System.out.print( "Enter a number: " ); int num = read.nextInt(); if ( num &lt; 13 ) {     System.out.println( "ZZ" ); } else if ( num &lt; 20 ) {     System.out.println( "YY" ); } else if ( num &lt; 40 ) {     System.out.println( "XX" ); } System.out.println( "WW" );</pre>
47. If the user enters -4, what is displayed? ZZ WW	
48. If the user enters 99, what is displayed? WW	

49. If x has an initial value of 8, what is displayed? x <del>8</del> 18	<pre>// x is declared and assigned a value if ( x &gt; 10 )     x = x + 2; else if ( x &lt; 5 )     x++; if ( x &lt;= 20 )     x = 2*x; else if ( x &gt; 5 )     x++; System.out.println( x );</pre>
50. If x has an initial value of 11, what is displayed? x <del>11</del> 26	
51. If x has an initial value of 19, what is displayed? x <del>19</del> 22	

<p>52. What values of x will cause "AE" to be displayed? If "AE" will never be displayed, write none.  <math>x &lt; 10</math> but not 5</p> <p>53. What values of x will cause "CD" to be displayed? If "CD" will never be displayed, write none.  11 or 12</p> <p>54. What value of x causes only one letter to be displayed? And what letter is displayed?  5 ≠ A</p>	<pre>// x is declared as an int and assigned a value if ( x &lt; 10 )     System.out.println("A"); else if ( x &gt; 12 )     System.out.println("B"); else     System.out.println("C"); if ( x &gt; 10 )     System.out.println("D"); else if ( x != 5 )     System.out.println("E");</pre>
<p>55. If x has a value of 56, what is displayed?  south</p> <p>56. What values of x will cause "west" to be displayed? If "west" is never displayed, write NEVER.  <math>10 \leq x &lt; 20</math></p>	<pre>// x is declared as an int and assigned a value if ( x &gt;= 20 &amp;&amp; x &lt;= 40 )     System.out.println( "north" ); else if ( x &gt;= 20 )     System.out.println( "south" ); else if ( x &lt; 10 )     System.out.println( "east" ); else     System.out.println( "west" ); }</pre>
<p>57. If z has a value of 8, what is displayed?  z   8   14   13</p> <p>58. If z has a value of 32, what is displayed?  z   32   38   47</p>	<pre>// z is declared as an int and assigned a value if ( z &gt;= 22 )     z = z + 6; else if ( z &lt;= 15 )     z = z + 1;  if ( z &lt;= 40 )     z = z + 9; else     z = z + 14;  System.out.println( z );</pre>

rough one.

< 10