

## MATHEMATICS

### AP Computer Science AB 1-2

Grades 9-12	(In summer, Computer Programming C++ 3-4)	
<p>1. Students use the five special classes provided by the AP examining committee: <code>apvector</code>, <code>apmatrix</code>, <code>apstring</code>, <code>apstack</code>, and <code>apqueue</code>.</p> <p>4. Students learn to use classes, including class instance constructors and destructors.</p> <p>7. Students learn “ring buffer” queuing.</p> <p>10. Students learn to use expression trees.</p> <p>13. Students learn standard sorting techniques: selection sorts, insertion sorts, bubble sorts, mergesorts, quicksorts, treesorts, and heapsorts.</p>	<p>2. Students practice Monte Carlo methods, such as estimating using series.</p> <p>5. Students learn to use linked lists.</p> <p>8. Students become familiar with operator overloading.</p> <p>11. Students learn Big-O notation.</p> <p>14. Students become familiar with the AP “Big Integer” case study.</p>	<p>3. Students learn when in-line functions are appropriate and practice function overloading.</p> <p>6. Students learn how to use stacks in appropriate situations.</p> <p>9. Students learn to use binary search trees and heaps.</p> <p>12. Students learn to use hashing algorithms.</p> <p>15. Students learn responsible use of computer systems, including system reliability, privacy, legal issues involving intellectual property, and social and ethical ramifications of computer use.</p>