Solution 21.21

(a) Analytical solution:

$$M = \int_0^{11} 5 + 0.25x^2 \; dx = \left[5x + 0.083333x^3 \right]_0^{11} = 165.9167$$

(b) Trapezoidal rule:

$$I = (1-0)\frac{5+5.25}{2} + (2-1)\frac{5.25+6}{2} + \bullet\bullet\bullet = 166.375$$

(c) Simpson's rule:

$$I = (2-0)\frac{5+4(5.25)+6}{6} + (4-2)\frac{6+4(7.25)+9}{6} + \bullet\bullet\bullet = 165.9167$$