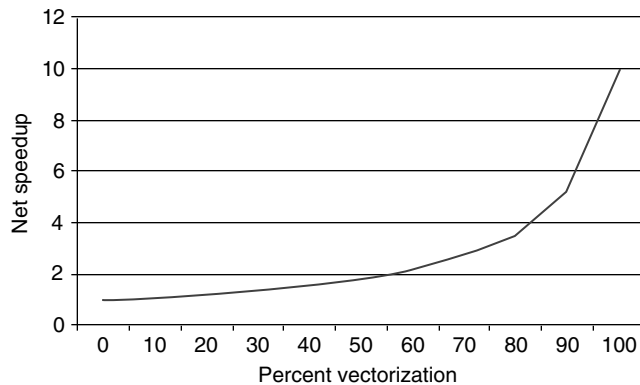


- 1.13 a. Itanium, because it has a lower overall execution time.  
 b. Opteron:  $0.6 \times 0.92 + 0.2 \times 1.03 + 0.2 \times 0.65 = 0.888$   
 c.  $1/0.888 = 1.126$
- 1.14 a. See Figure S.1.  
 b.  $2 = 1/((1 - x) + x/10)$   
 $5/9 = x = 0.56$  or 56%  
 c.  $0.056/0.5 = 0.11$  or 11%  
 d. Maximum speedup =  $1/(1/10) = 10$   
 $5 = 1/((1 - x) + x/10)$   
 $8/9 = x = 0.89$  or 89%



**Figure S.1** Plot of the equation:  $y = 100/((100 - x) + x/10)$ .

- e. Current speedup:  $1/(0.3 + 0.7/10) = 1/0.37 = 2.7$   
 Speedup goal:  $5.4 = 1/((1 - x) + x/10) = x = 0.91$   
 This means the percentage of vectorization would need to be 91%
- 1.16 a.  $1/(0.8 + 0.20/2) = 1.11$   
 b.  $1/(0.7 + 0.20/2 + 0.10 \times 3/2) = 1.05$   
 c. fp ops:  $0.1/0.95 = 10.5\%$ , cache:  $0.15/0.95 = 15.8\%$
- 1.18 a.  $1/((.2 + .8/N)$   
 b.  $1/((.2 + 8 \times 0.005 + 0.8/8) = 2.94$   
 c.  $1/((.2 + 3 \times 0.005 + 0.8/8) = 3.17$   
 d.  $1/((.2 + \log N \times 0.005 + 0.8/N)$   
 e.  $d/dN(1/((1 - P) + \log N \times 0.005 + P/N)) = 0$