$$a(1) = 1$$
 $a(2) = 1 \cdot 2 = 2$ 
 $a(3) = 2 \cdot 3 = 6$ 
 $a(4) = 6 \cdot 4 = 24$ 
 $a(5) = 24 \cdot 5 = 120$ 
 $a(6) = 120 \cdot 6 = 720$