

2.10 Exercise. Express $n = 12!$ as a product of primes.

$$\begin{aligned}n &= 1(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(12) \\&= 1(2)(3)(2 \times 2)(5)(2 \times 3)(7)(2 \times 4)(3 \times 3)(2 \times 5)(11)(3 \times 4) \\&= 1(2)(3)(2 \times 2)(5)(2 \times 3)(7)(2 \times 2 \times 2)(3 \times 3)(2 \times 5)(11)(3 \times 2 \times 2) \\&= 1 \times 2^{10} \times 3^5 \times 5^2 \times 7 \times 11\end{aligned}$$