Count the number of even divisors of 1280.

Solution: We factor 1280.

$$1280 = 4 \cdot 320 = 4 \cdot 32 \cdot 10 = 2^2 \cdot 2^5 \cdot 2 \cdot 5 = 2^8 \cdot 5$$

Now, DFPF says that the divisors of this number are of the form $2^a 5^b$ with $0 \leq a \leq 8$ and $0 \leq b \leq 1$. To get even factors, we need at least one copy of 2 and hence $1 \leq a \leq 8$. Thus, we have $(7+1)(1+1) = 16$ possible even divisors of 1280.