EX: Find the product of the following octal numbers. Express your answer in both decimal and in binary.

$34 \cdot 5$ (octal numbers)

SOL'N: We can convert to decimal and then multiply.

$$34\,\text{octal} = 3 \cdot 8 + 4 \cdot 1 = 28\,\text{decimal}$$

$$28 \cdot 5 = 140\,\text{decimal}$$

We convert back to binary by taking remainders when we divide by 2's:

$$\frac{140}{2} = 70\,r\,0$$

$$\frac{70}{2} = 35\,r\,0$$

$$\frac{35}{2} = 17\,r\,1$$

$$\frac{17}{2} = 8\,r\,1$$

$$\frac{8}{2} = 4\,r\,0$$

$$\frac{4}{2} = 2\,r\,0$$

$$\frac{2}{2} = 1\,r\,0$$

$$\frac{1}{2} = 0\,r\,1$$

Reading off remainders, from bottom to top, we have our binary answer:

10001100 binary