Test your knowledge. Complete the table by calculating and filling in the unknowns. Show the conversions!

Base 10		Base 2		Base 8		Base 16
127	=	1111111_2	=	177_8	=	$7F_{16}$
21_{10}	=	10101	=	25_8	=	15_{16}
57_{10}	=	$111\,0001_2$	=	71	=	39_{16}
171_{10}	=	10101011_2	=	253_8	=	AB

(My work is below)

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CSC 17A — Dr. Lehr
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① 127_{10}

Base 2 (②)	Base 8 (③)	Base 16 (step ①)
$7F_{16}$	111111_2	127_{10}
$111\ 1111_2$	177_8	$127/16 = 7$ % $15 = F$
1111111_2	OR	$7/16 = 0$ 7
	$127/8 = 15$ % 7	$7F_{16}$
	$15/8 = 1$ 7	
	$1/8 = 0$ 1	
	177_8	

② 10101_2

Base 10 (③)	Base 8 (②)	Base 16 (①)
25_8	10101_2	10101_2
$2 \cdot 8 + 5 = 16+5 = 21$	$010\ 101_2$	$0001\ 0101$ (bc base 16 4 bits)
Expanded:	25_8	$1\ 5_{16}$
$2(8^1) + 5(8^0)$		15_{16}
$= 2(8) + 5(1)$		
$= 16 + 5$		
$= 21_{10}$		

③ 71_8

Base 10	Base 2	Base 16
$7(8^1) + 1(8^0)$	71_8	111001_2
$7(8) + 1(1)$	$111\ 001_2$	39_{16}
$56 + 1$	111001_2	
57_{10}		

④ AB

Base 10	Base 2	Base 8
$= 10(16^1) + 11(16^0)$	AB	10101011_2
$= 10(16) + 11(1)$	$1010\ 1011_2$	253_8
$= 160 + 11$	10101011_2	OR
$= 171_{10}$		171_{10}
		$171/8 = 21$ % 3
		$21/8 = 2$ 5
		$2/8 = 0$ 2
		253_8