

$$\textcircled{1} \quad 3207_8$$

$$= 3 \times 8^3 + 2 \times 8^2 + 0 \times 8^1 + 7 \times 8^0$$

$$= 1671_{10}$$

$$\textcircled{2} \quad ACF7_{16}$$

$$= 10 \times 16^3 + 12 \times 16^2 + 15 \times 16^1 + 7 \times 16^0$$

$$= 44279_{10}$$

| | | |
|----------|---|----|
| A_{16} | = | 10 |
| B_{16} | = | 11 |
| C_{16} | = | 12 |
| D_{16} | = | 13 |
| E_{16} | = | 14 |
| F_{16} | = | 15 |

$$\textcircled{3} \quad D3.C5_{16}$$

$$= 13 \times 16^1 + 3 \times 16^0 + 12 \times 16^{-1} + 5 \times 16^{-2}$$

$$= 208 + 3 + \frac{12}{16} + \frac{5}{16^2}$$

$$\approx 211.770$$

④

a)

$$621 \div 8$$

$$77 \div 8$$

$$9 \div 8$$

$$1 \div 8$$

| Q | R |
|----|---|
| 77 | 5 |
| 9 | 5 |
| 1 | 1 |
| 0 | 1 |

$$621_{10} = 1155_8$$

b)

$$0.84375 \times 4$$

$$0.375 \times 4$$

$$0.5 \times 4$$

| Integer | Non-Integer |
|---------|-------------|
| 3 | 0.375 |
| 1 | 0.5 |
| 2 | 0 |

$$0.84375_{10} = 0.312_4$$

⑤

$$125 \div 16$$

$$7 \div 16$$

| Q | R |
|---|----|
| 7 | 13 |
| 0 | 7 |

| |
|---------------|
| $A_{16} = 10$ |
| \vdots |
| $D_{16} = 13$ |

$$0.21875 \times 16$$

$$0.5 \times 16$$

| Integer | Non-Integer |
|---------|-------------|
| 3 | 0.5 |
| 8 | 0 |

$$125.21875_{10} = 7D.38_{16}$$

(6)

$$54 \div 5$$

$$10 \div 5$$

$$2 \div 5$$

| Q | R |
|----|---|
| 10 | 4 |
| 2 | 0 |
| 0 | 2 |

$$0.525 \times 5$$

$$\left\{ \begin{array}{l} 0.625 \times 5 \\ 0.125 \times 5 \end{array} \right.$$

$$\left\{ \begin{array}{l} 0.625 \times 5 \end{array} \right.$$

| Integer | Non-Integer |
|---------|-------------|
| 2 | 0.625 |
| 3 | 0.125 |
| 0 | 0.625 |

repeating

$$54.525_{10} = 204.2\overline{30}_5$$

⑦

| | Integer | Non-Integer |
|----------------|---------|-------------|
| 0.1×2 | 0 | 0.2 |
| 0.2×2 | 0 | 0.4 |
| 0.4×2 | 0 | 0.8 |
| 0.8×2 | 1 | 0.6 |
| 0.6×2 | 1 | 0.2 |

0.2×2 repeating

$$0.1_{10} = 0.00\overline{0011}_2$$

$$\textcircled{8} \text{ a) } 37.14_8$$

$$= 011 \ 111. \ 001 \ 100_2$$

$$= 11 \ 111. \ 0011_2$$

$$\text{b) } 10 \ 1011. \ 11011_2$$

$$= 0010 \ 1011. \ 1101 \ 1000_2$$

$$= 2 \ B. \ D8_{16}$$

$$\text{c) } AD.84_{16}$$

$$= 1010 \ 1101. \ 1000 \ 0100_2$$

$$= 010 \ 101 \ 101. \ 100 \ 001_2$$

$$= 2 \ 5 \ 5. \ 41_8$$

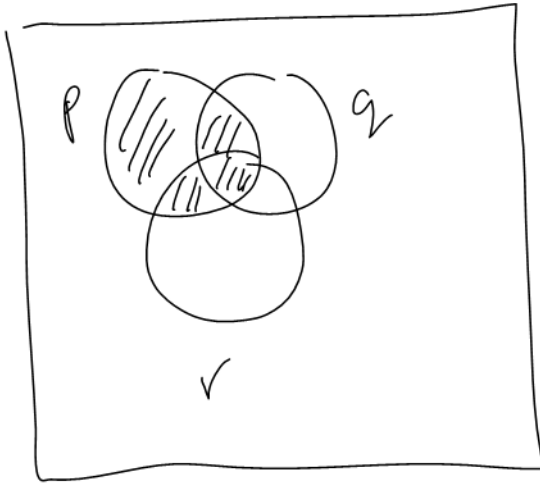
| Binary | Decimal | Hexadecimal |
|----------|---------|-------------|
| 1010_2 | 10 | A_{16} |
| 1011_2 | 11 | B_{16} |
| 1100_2 | 12 | C_{16} |
| 1101_2 | 13 | D_{16} |
| 1110_2 | 14 | E_{16} |
| 1111_2 | 15 | F_{16} |

- ⑨ a) YES b) MAYBE
c) YES d) No
e) YES f) MAYBE

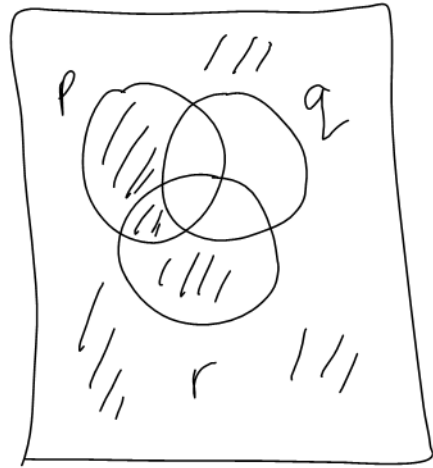
- ⑩ a) No
b) YES
c) YES
d) No
e) YES

- ⑪ a) $c \oplus t$
b) $c \wedge \sim t$
c) $c \wedge (c \vee t)$
d) $c \vee (c \wedge t)$

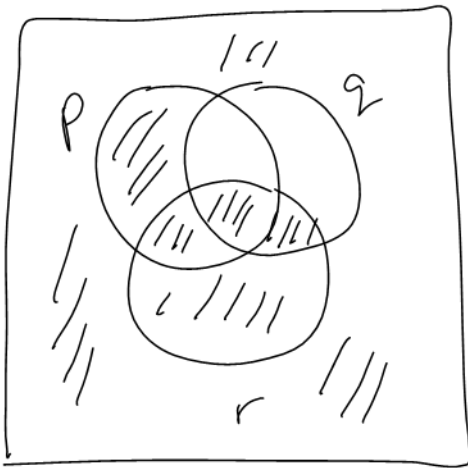
12



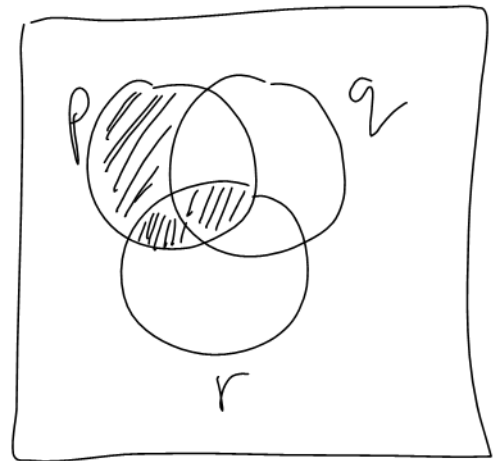
P



$\sim Q$



$\sim Q \cup R$



$P \cap (\sim Q \cup R)$

13

| p | q | r | $\sim q$ | $p \oplus \sim q$ | $(p \oplus \sim q) \wedge r$ |
|-----|-----|-----|----------|-------------------|------------------------------|
| 0 | 0 | 0 | 1 | 1 | 0 |
| 0 | 0 | 1 | 1 | 1 | 1 |
| 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 1 | 1 | 0 | 0 | 0 |
| 1 | 0 | 0 | 1 | 0 | 0 |
| 1 | 0 | 1 | 1 | 0 | 0 |
| 1 | 1 | 0 | 0 | 1 | 0 |
| 1 | 1 | 1 | 0 | 1 | 1 |

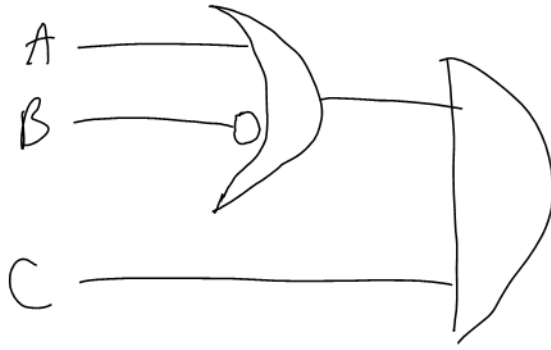
14

| p | q | $\sim q$ | $p \vee \sim q$ | $(p \vee \sim q) \wedge q$ | $p \wedge q$ |
|-----|-----|----------|-----------------|----------------------------|--------------|
| 0 | 0 | 1 | 1 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 1 | 0 | 0 |
| 1 | 1 | 0 | 1 | 1 | 1 |

└──────────────────┘
Identical

Yes. $(p \vee \sim q) \wedge q \iff p \wedge q$

15



16

| A | B | \bar{B} | $\bar{B}A$ | $\bar{B} + \bar{B}A$ |
|---|---|-----------|------------|----------------------|
| 0 | 0 | 1 | 0 | 1 |
| 0 | 1 | 0 | 0 | 0 |
| 1 | 0 | 1 | 1 | 1 |
| 1 | 1 | 0 | 0 | 0 |

Identical

$$\bar{B} + \bar{B}A \Leftrightarrow \bar{B}$$