$V_{in} = 11.2$ $V_{REF} = 16$

1 0 0 0

$V_{in} > V_{DAC}$ $V_{DAC} > V_{in}$

<u>1</u> <u>1</u> 0 0   <u>0</u> <u>1</u> 0 0

- MSB kept as is   • MSB set to zero
- Next bit is set to 1   • Next bit set to 1

$V_{in} = 11.2V$ $V_{REF} = 16V$

11.2   8V   1 0 0 0   8   11.2
$V_{in} > V_{DAC}$ $\cancel{V_{DAC} > V_{in}}$

        <u>1</u> <u>1</u> 0 0   <u>0</u> <u>1</u> 0 0

11.2   12   12   11.2
$V_{in} > V_{DAC}$ ✗ $V_{DAC} > V_{in}$

    1 <u>1</u> <u>1</u> 0   1 <u>0</u> <u>1</u> 0

                                    $\vee$

        11.2   10   10   11.2
        $V_{in} > V_{DAC}$ $\cancel{V_{DAC} > V_{in}}$

            1 0 <u>1</u> <u>1</u>   1 0 <u>0</u> 1

    11.2   11   11   11.2
    $V_{in} > V_{DAC}$ $V_{DAC} > V_{in}$ ✗

        1 0 1 <u>1</u> _   1 0 1 <u>0</u> _

V

$V_{REF} =$ 16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

1000   1100   1010   1011   1011
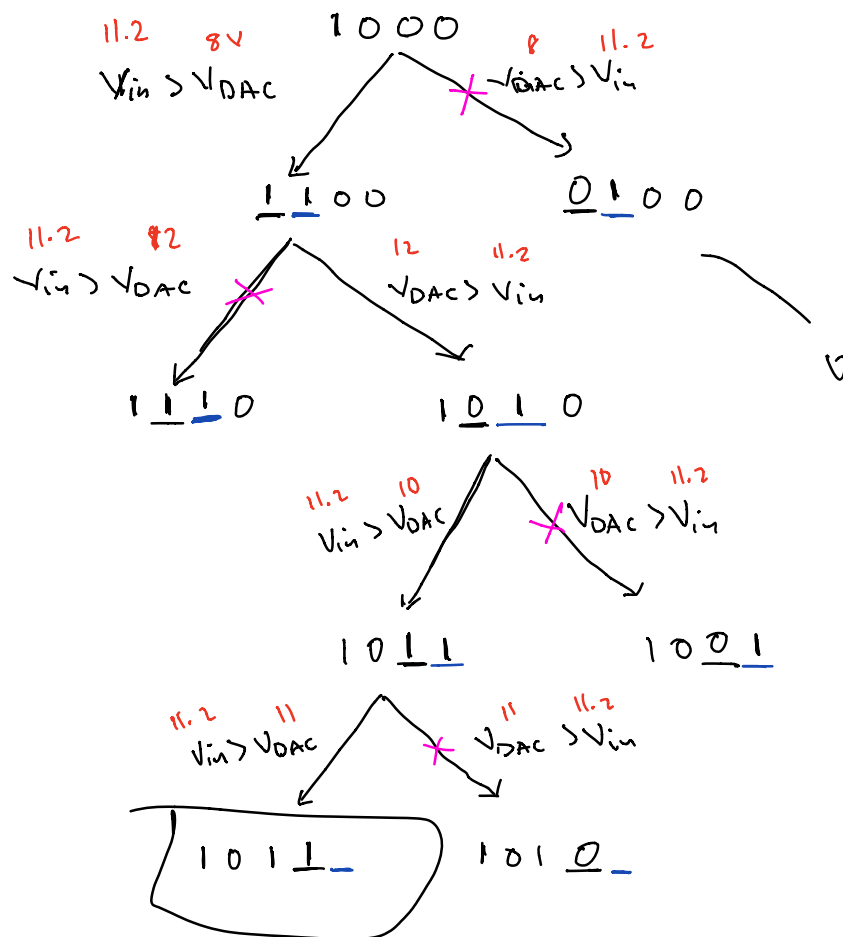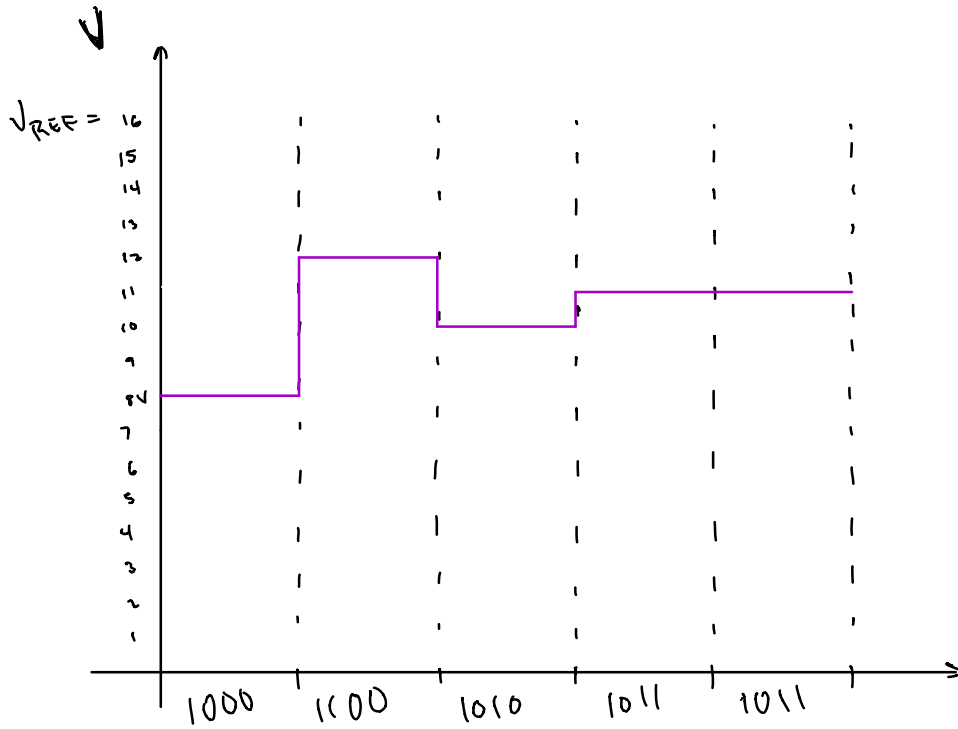
# of bits

Conversion Time = n × Clock

2.3

SAD

||||

1000

K

DAC

128

100
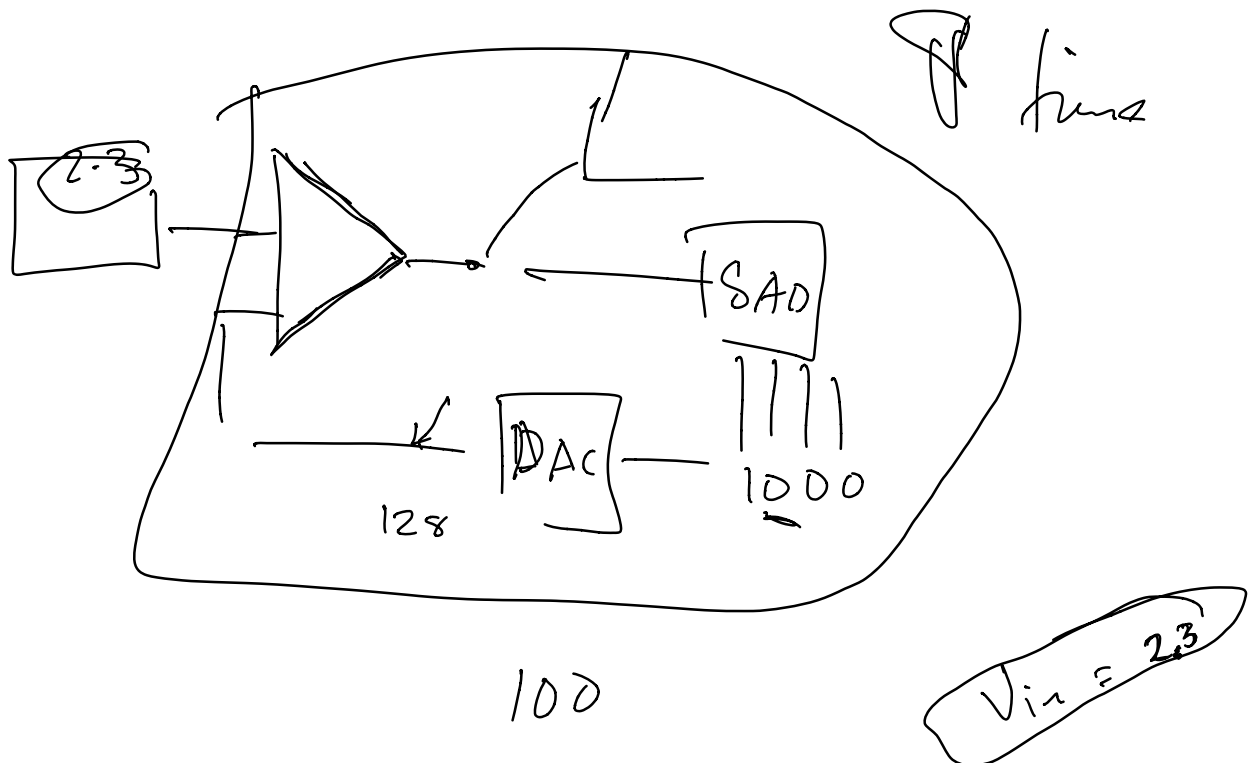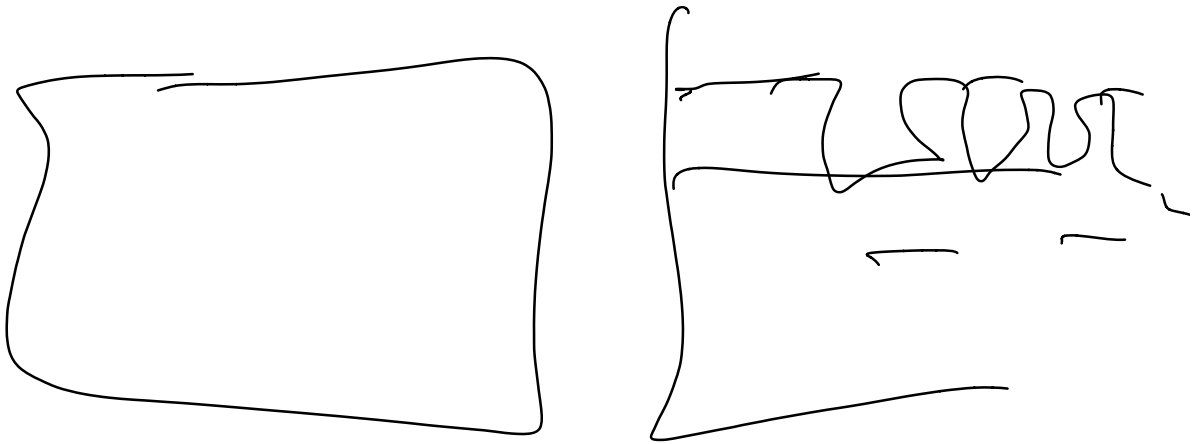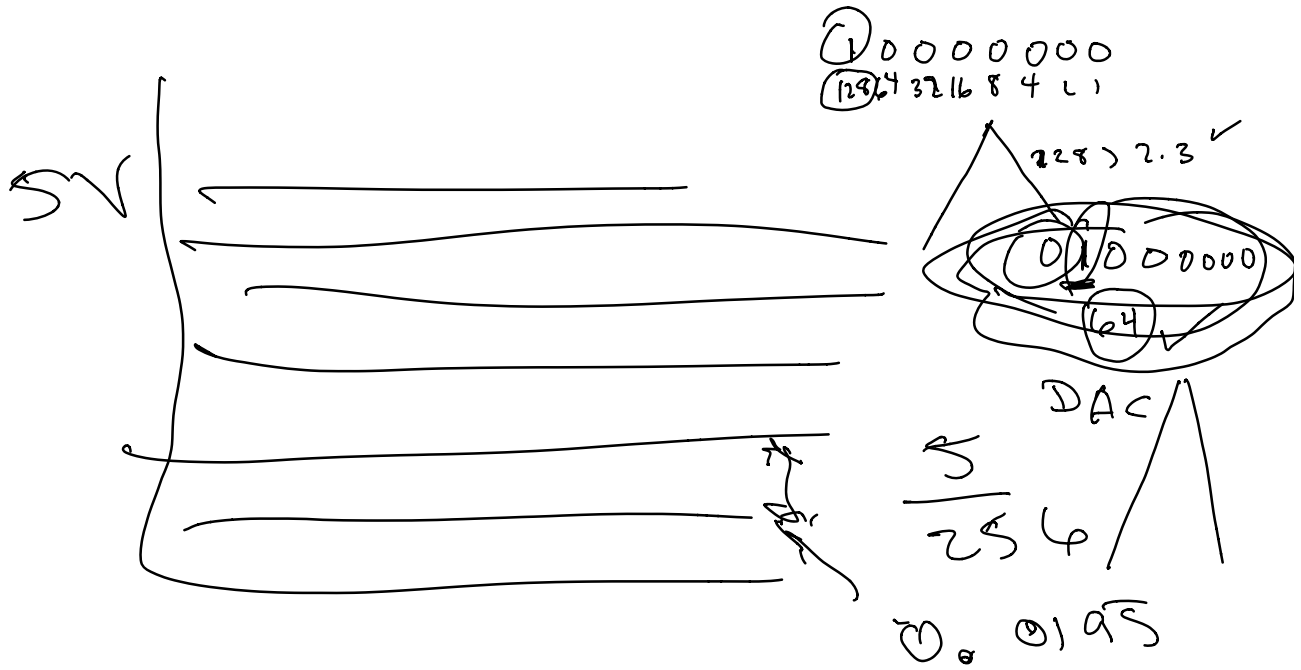
$V_{in} = 2.3$

① 0 0 0 0 0 0 0
(128) 64 32 16 8 4 2 1

128) 2.3 ✓

5V

0 ① 0 0 0 0 0 0
64

DAC

$\frac{5}{256}$

0.0195

25

00000001
128 64 32 16 8 4 2 1

1 0 0 0 0 0 0 0
1 2 4 8 16 32 64 128

2

V_{in} +

V_{DAC} −

8 bit   256 $\frac{5}{256} = 0.02$
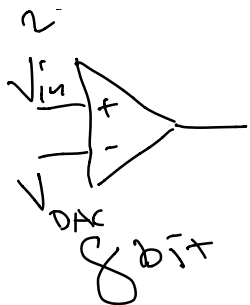
10000000

$V_{DAC} > V_{in} = 0$

01000000 $= \frac{64}{1.25}$ 0

$V_{DAC} > V_{in}$

96   01100000 → 1.87 $V_{DAC} < V_{in}$ −

112 0111.10000 → 2.1 $V_{DAC} < V_{in}$ 1

120 01111000 → 2.34 $V_{DAC} < V_{in}$
        0

116 01110100 → 2.26 $V_{DAC} < V_{in}$ → 1

118 01110110 → 2.3047 $V_{DAC} < V_{in}$ 0

117 01110101   2.28 $V_{DAC} < V_{in}$ 1

01110101 ―