0-5V range 8bit ADC

2V A2D

max min

11111111 00000000

255 0

$\frac{5-0}{255-0} \Rightarrow \frac{5V}{255\ ADC_{out}}$ → 0.0196 V/div

what does ADC read with 2V in

$102 = 2V \times \frac{255\ ADC_{out}}{5V}$

64_{32} 4_2

0110 0 110

ADC rang 0-10V 12bit adc

7.35V ADCin

$\frac{10}{2^{12}-1}$ $\frac{10V}{4095_{ADC}}$ → 0.00244V

$ADC_{out} = 7.35 \times \frac{4095\ ADC}{10}$

$= 3009.825$

ADC outputs integer values only

3009 → 3010

ADC range −10 to 10V 12 bit

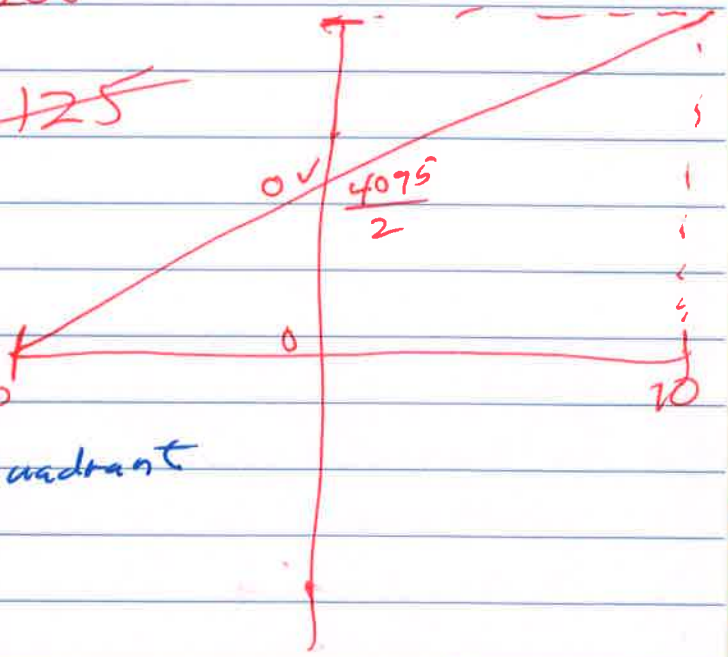
7.35 V_{in}

$$\frac{10-(-10)}{2^{12}-1} \quad \frac{20V}{2^{12}-1} \Rightarrow 0.00488\ V/div$$

$$Adc_{out} = 7.35V \frac{2^{12}-1}{20V} = 4095$$

1504.9125

ADC_{out} = 1505



but 1505 on graph is in the − (neg) quadrant of voltage

So I can add 10 to the given value (shift the Graph)

$$17.35 \times \frac{2^{12}-1}{20}$$

= 3552.2

reverse process

3552 ADC $\frac{20V}{12^{12}-1}$

17,3 V in

but because of the range of -10 to 10

I have to sub 10 V

17,3 - 10 = 7,3 V

We have a sensor measuring °F

Sensor { 32° - 212°
0 - 5V

ADC FSR 0 - 5V
8 bit ADC 0 - 255 out

Lets say we have 100° as our mV (PV)

$$V = 100^{\circ} \times \frac{5V - 0V}{212^{\circ} - 32^{\circ}}$$

$$V = 2.77V$$

So that is the ADC input

$$ADC_{out} = 2.77V \times \frac{2^8 - 1}{5 - 0}$$

$$ADC_{out} = 141.27$$