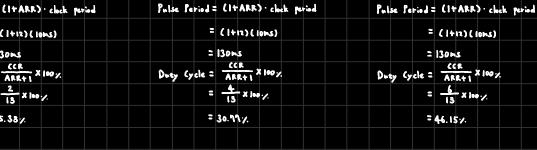
## 2.3 Questions

Now that everything is set up, you will now be able to play around with different PWM outputs. As an exercise, choose an ARR value and compute the pulse width and duty cycle for the following cases. Make sure to turn this in along with the questions at the end.

ARR =\_12

Case	CCR Value	Pulse Width	Pulse Period	Duty Cycle
1	$CCR = \frac{1}{6} \times ARR = $	20 m.S	30ms	15.38%
2	$CCR = \frac{1}{3} \times ARR = $	40 m5	130 05	30.11%
3	$CCR = \frac{1}{2} \times ARR = $	lons	130m£	46.15%

1.	Pulse	b;	dek=	CCR	clock	Park	Į.		2.	Pols	ie W	idek:	- CCR	· clock	peri	.1	
			=	(2)(1	ers)							:	(4)(	(2/40			
			=	20 ms								•	40m	s			
	Pulse	fer	: Loi	(It	ARR)	· cloc	k per	is d		Pals	ie Pe	riod =	(1+	ARR)	· clo	ik pe	ind
			=	CI+i	2) ( le	hs)						=	(1+	13)(1	ons)		
				30ms									130m				
	Duty	Cyc	le =	ARI	X +1 X	100 y.				Due	y Cy	cle =	AR	R R+1	100%		
					X los							=	13	X los	γ.		
			= (	5.38	<b>y</b> .							=	30.7	١٧.			

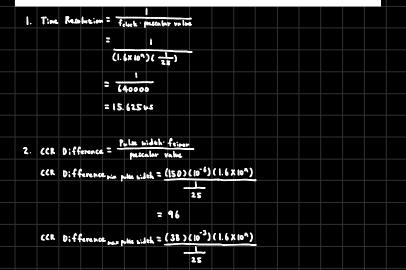


3. Pulse Width = CCR · clock period

=(6)(lons) = 60ms

3.3 Questions 44400 Assume a system clock frequency of 16 MHz, a prescaler value of 25, and the maximum ARR.

- 1. What is the time resolution (i.e. minimum time unit) of the input capture function?
- 2. The pulse width of the ultrasonic sensor's output is in the range 150  $\mu s$  to 38 ms. What are the differences in CCR values between two consecutive interrupts that correspond to the minimum and maximum pulse widths? Assume that the rising edge is triggered at CCR = 0.
- 3. What is the time (in seconds) between two consecutive timer resets?



= 24320