



## Tip of the Day

I received a very positive response on previous Tip, so here is another one. It'll help you to convert numerical data to time format and to use combination of absolute (with \$ symbol) and relative references in MS Excel™ for fast tables creation.

B3					fx =2000/(B2*86400)				
A	B	C	D	E					
1	Target:								
2	Time	6:32.00							
3	Speed	5.10							
4									

A5					fx 60%				
A	B	C	D	E					
1	Target:								
2	Time	6:32.00							
3	Speed	5.10							
4	Training:								
5	60%	3.06							
6	65%	3.32							
7									
8									

B5					Font					fx =\$B\$3*A5				
A	B	C	D	E										
1	Target:													
2	Time	6:32.00												
3	Speed	5.10												
4	Training:													
5	60%	3.06												
6	65%	3.32												
7	70%	3.57												
8	75%	3.83												

- Repeat step 2 to create a row of distances;
- In cell C5 calculate the time of the piece by dividing distance C\$4 (relative column and absolute row) with speed \$B5 (absolute column and relative row) and with 86400 to convert it into a time format. You can press the "F4" key for cyclic conversion of the references: C4-\$C\$4-C\$4-\$C4-C4... Format the cell as the time value and fill to the right and down.

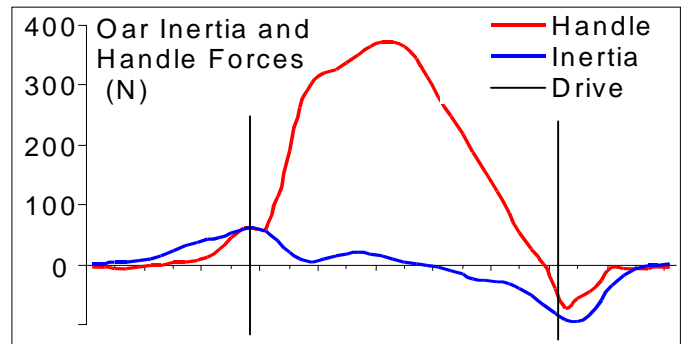
C5											fx =C\$4/\$B5/86400										
A	B	C	D	E	F	G	H	I	J												
1	Target:																				
2	Time	6:32.00																			
3	Speed	5.10																			
4	Training:		250	500	750	1000	1250	1500	1750	2000											
5	60%	3.06	1:21.67	2:43.33	4:05.00	5:26.67	6:48.33	8:10.00	9:31.67	10:53.33											
6	65%	3.32	1:15.38	2:30.77	3:46.15	5:01.54	6:16.92	7:32.31	8:47.69	10:03.08											
7	70%	3.57	1:10.00	2:20.00	3:30.00	4:40.00	5:50.00	7:00.00	8:10.00	9:20.00											
8	75%	3.83	1:05.33	2:10.67	3:16.00	4:21.33	5:26.67	6:32.00	7:37.33	8:42.67											
9	80%	4.08	1:01.25	2:02.50	3:03.75	4:05.00	5:06.25	6:07.50	7:08.75	8:10.00											
10	85%	4.34	0:57.65	1:55.29	2:52.94	3:50.59	4:48.24	5:45.88	6:43.53	7:41.18											
11	90%	4.59	0:54.44	1:48.89	2:43.33	3:37.78	4:32.22	5:26.67	6:21.11	7:15.56											
12	95%	4.85	0:51.58	1:43.16	2:34.74	3:26.32	4:17.89	5:09.47	6:01.05	6:52.63											
13	100%	5.10	0:49.00	1:38.00	2:27.00	3:16.00	4:05.00	4:54.00	5:43.00	6:32.00											
14	105%	5.36	0:46.67	1:33.33	2:20.00	3:06.67	3:53.33	4:40.00	5:26.67	6:13.33											
15																					

In less than 1 minute you can create a table with times for different distances at different speeds. Enjoy!

## Facts. Did You Know That...

...oar inertia forces are not as low as they appear. Rowing oars are really light (1.4 kg scull and 2.6 sweep oar), but they are long and the heaviest parts

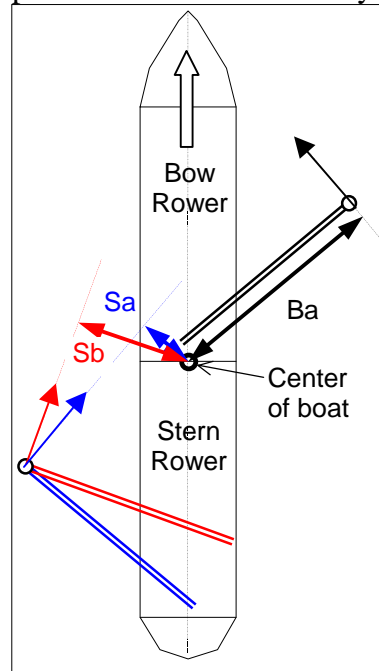
are placed at the ends. We defined moments of inertia as 6.6 kgm for sweep oar 4.4 kgm for scull.



Here is a graph showing the contribution of oar inertia to the handle force in 1x at 36 str/min. It is nearly 100% at catch and release, which are 70-80 N forces.

## Ideas. What if...

...you use different catch and release angles in stroke and bow seats of a pair. From a biomechanical point there is no reason why they should be the same



We've measured 4-5° difference in very good crews. At the catch a shorter angle in stroke rower will reduce the difference in rotating moments. On the drawing **Sa** and **Ba** are rotating levers of the stroke and bow rowers at the same catch angles. **Sb** is the rotating moment of the stroke rower at a shorter angle. The length of **Sb** lever has less difference relative to **Ba**.

A longer release angle in stroke seat also reduces rotating moment at the finish of the drive. So, just move foot-stretcher 3-5 cm to the bow in the stroke seat and see how it goes. Tell me if I'm wrong.

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