

## Time Penalties for CMS Magic Competitions

The effect of this formula is that a performer who is:

- under time is not penalised;
- close to (but not over) the target performing time gets a small bonus;
- slightly over time is not penalised;
- over time by a significant amount is increasingly penalised.

This is how it would operate. The time keeper records a performer's time on the score sheet. Times are rounded down to the nearest five seconds so (for example) times from 10 minutes to 10 minutes and 4 seconds would be counted as 10 minutes, and times from 10 minutes and 5 seconds to 10 minutes and 9 seconds would be counted as 10 minutes and 5 seconds, ...

The time keeper then allocates bonus points or penalties to each performer according to the following scheme:

p e r f o r m e r ' s   t i m e	p o i n t s
under 9 mins	0
9 mins to 9 mins + 25 secs	+1
9 mins + 30 secs to 10 mins	+2
10 mins + 5 secs to 10 mins + 25 secs	0
10 mins + 30 secs or over	penalty according to formula

If a performer's time over 10 minutes measured in seconds is  $t$  and  $S_{\max}$  is the maximum possible score then the penalty  $P$  is given by:

$$P = S_{\max} \sqrt{\left(\frac{t-10}{170}\right)^5}$$

These are the penalties

<b>seconds over 10 minutes penalty</b>	30	35	40	45	50	55	60					
	-1	-1	-2	-2	-3	-4	-6					
<b>seconds over 10 minutes penalty</b>	65	70	75	80	85	90	95	100	105	110	115	120
	-7	-9	-11	-13	-16	-18	-21	-24	-28	-32	-36	-40
<b>seconds over 10 minutes penalty</b>	125	130	135	140	145	150	155	160	165	170	175	180
	-45	-50	-56	-61	-67	-74	-81	-88	-95	-103	-111	-120

The timekeeper would stop a performer after 13 minutes (3 minutes over) as their score would now be certain to be negative.

