Premature birth has been associated with damage in many regions of the cerebral cortex, although there is a particularly strong susceptibility for damage within the parieto-occipital lobes (Volpe, 2009). As these areas have been shown to be critical for both visual attention and magnitudes perception (time, space, and number), it is important to investigate the impact of prematurity on both the magnitude and attentional systems, particularly for children without overt white matter injuries, where the lack of obvious injury may cause their difficulties to remain unnoticed. In this study, we investigated the ability to judge time intervals (visual, audio and audio-visual temporal bisection), discriminate between numerical quantities (numerosity comparison), map numbers onto space (numberline task) and to maintain visuo-spatial attention (multiple-object-tracking) in school-age preterm children (N29). The results show that various parietal functions may be more or less robust to prematurity-related difficulties, with strong impairments found on time estimation and attentional task, while numerical discrimination or mapping tasks remained relatively unimpaired. Thus while our study generally supports the hypothesis of a dorsal stream vulnerability in children born preterm relative to other cortical locations, it further suggests that particular cognitive processes, as highlighted by performance on different tasks, are far more susceptible than others.