Calculations on speed, distance and time.

Attempt **all** questions showing **all** working out and always include final units.

(1.) Calculate the average speed of Asafa Powell who sprints a 200m race in a time of exactly 20 seconds.   [2]

(2.) Calculate how long a cricketer has to react to a bowler's delivery moving at 30 m /s over a distance of 20 metres.   [2]

(3.) An archer fires an arrow at a speed of 20 m /s which hits the target 1.5 seconds later. How far away is the target?   [2]

(4.) Calculate the average speed (in km/hr) of a Jumbo Jet which flies 10 000 km from Heathrow to Pudong airport in 12 hours ? [2]

(5.) How long it will take a student cycling at 6 m/s to get to Century Park 12 km away. [3]

(6.) How far does a car travelling along the freeway at 22 m / s go in 1 minute. [3]

(7.) What is the average speed (in km/hr) of a runner who completes a marathon (42.2 km) in a time of 3 hours and 45 minutes. [3]

(8.) Work out the average speed (in km/hr) of a formula one racing car which completes 65 laps, each 4.5 Km long ,   [4]
      in 1 hour 30 minutes. Explain why we say 'the average speed' ?

(9.) If a train leaves Shanghai station for Hangzhou at 12.30 p.m. and travels at an average speed of 210 Km/hr for the 180 km journey
will the passengers arrive at the beautiful west lake in time for lunch at 1.20 p.m. ?   [3]

(10.) What is the average speed (in m/s and km/hr) of Michael Phelps as he completes a 1500m training swim in 15 minutes?   [3]

(11.) If a rabbit runs Eastwards towards it's burrow at a velocity of 8 m/s for 20 seconds what will it's final displacement be?   [3]

Slightly harder questions...

(12.) A fox chasing the rabbit above started off 40m behind. If it can run at 9 m /s will it be able to catch the little bunny for tea? [3]

(13.) An athlete runs at an average velocity of 6 m/s North for 15 minutes and then at 4.5 m/s West for 20 minutes.
      Calculate the distance travelled and her final displacement. (A diagram might help here.)   [4]

(14.) A boy sees a firework rocket explode in the air at a display 1 Km away but doesn't hear the bang for another 3 seconds.   [3]
       Based on this evidence work out the speed of sound in m/s.

(15.) How long does it take light to arrive on Earth from the Sun which is 150 million km away if it travels at 300 000 000 m /s ? [3]

(16.) If a jet fighter plane is capable of travelling at 1250 Km/hr is it supersonic i.e. faster than sound? (See q14.)   [2]

(17.) If the Earth has a radius of 6400 Km estimate how many times light could theoretically travel around it in 1 s ?   [3]

(18.) A light year is a unit of distance. It is how far light would travel in 1 year's time. How far is this in metres?   [2]

[Total marks 30 + 20]