TIME DISTANCE SPEED PROBLEMS III

1)(a) An aircraft takes 45 minutes to fly from Heathrow to Manchester, which is a distance of 165 miles. At what speed is the plane flying?

(b) If the plane flew at the same speed, how long would it take to fly from Manchester to Aberdeen, a distance of 242 miles?

2)(a) A bicycle has wheels of diameter 60cm. What is the circumference of the wheels?
(b) The wheels of the bicycle are turning at 350 revolutions per minute. How far (in metres) will the bike travel during one minute?
(c) At what speed is the bicycle travelling:
(i) in metres per second? (ii) in kilometres per hour?

3)(a) A light-year is the distance which light can travel in a year. If light travels at 300 000 km/s, find how many kilometres there are in a light year (in standard form).
(b) If a spacecraft travelled at 50000km/hr, how many years would it take to reach Proxima Centauri, the nearest known star, which is 4.3 light years away?

4)(a) Anne ran the 100 metres in 14.3 seconds. What was her average speed:
(i) in metres per second? (ii) in kilometres per hour?
(b) Brenda ran the 1500 metres in 4 minutes 23.4 seconds. What was her average speed:
(i) in metres per second? (ii) in kilometres per hour?
(c) If Anne could maintain the same speed for the 1500m as she did for the 100m, how much faster would her time be than Brenda's time?

5)(a) A train leaves Oxford at 10.48 to travel to Tackley. Due to engineering work, the train's speed is restricted for part of its journey. The train's speed is shown by the speed-time graph below.
(i) What was the maximum speed reached by the train (in miles per hour)?
(ii) For how long was the train accelerating?
(iii) The distance travelled by the train is given by the AREA under the graph. Calculate the distance travelled.
(iv) What speed (in mph) did the train have to travel at along the stretch affected by engineering work? For how many miles was it travelling at this speed?

6)(a) The portion of map below is on a scale of 1:25000. Estimate in kilometres the distance from Park Farm, Bletchingdon to Weston-on-the-Green church.
(b) Walking at 4km per hour, how many minutes would it take to walk this distance?
(c) A walk along footpaths is shown by a dashed line on the map. Estimate how long this walk would take if we walked at an average speed of 3km/hr.
(d) What is the bearing of that part of the walk from Park Farm to Pinchgate Barn?
(e) What bearing would you be walking on if you walked along this footpath in the opposite direction?
(f) The (approximate) distance-time graph below shows our actual progress around this walk.
(i) Where did we rest, and for how long?
(ii) Which part of the walk was the slowest? What speed were we travelling at on this section?
(iii) How long did the whole walk take? What was our average speed for the walk?