Y9 Physics (Motion) End of Unit Test **Name : _____**

Question	1	2	3	4	5	6	7	8	Total
Maximum marks	6	6	12	4	6	12	9	5	**60**
Awarded marks									

Q1. This question is about standard (SI) units and definitions.

a) Complete the table below to show the correct unit symbol for each quantity. **(5)**

Quantity	SI unit
Distance	
Time	
Speed	
Acceleration	
Force	

b) Speed and velocity both have the same units.
Describe the characteristic that makes velocity different from speed. **(1)**

_____

_____

Q2. This question is about speed, distance and time calculations.

a) State the equation that links speed, distance and time. **(1)**

b) Calculate the speed of a cyclist who travels 1200 m in 300 s. **(2)**

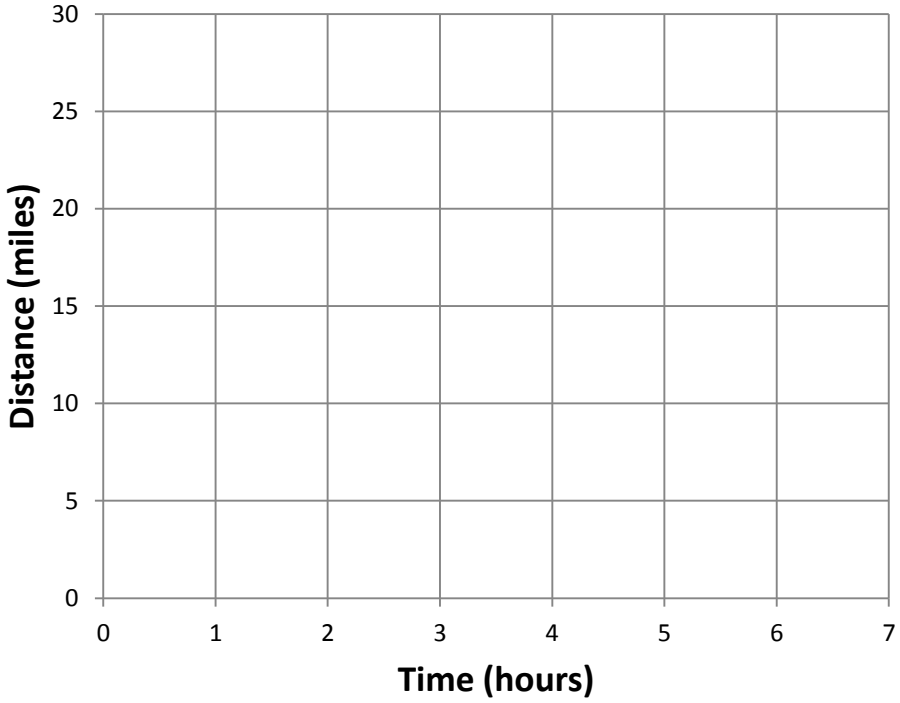
speed = _____ m/s

c) A dog runs at a constant speed of 12 m/s.
Calculate the distance it will travel in two minutes. **(3)**

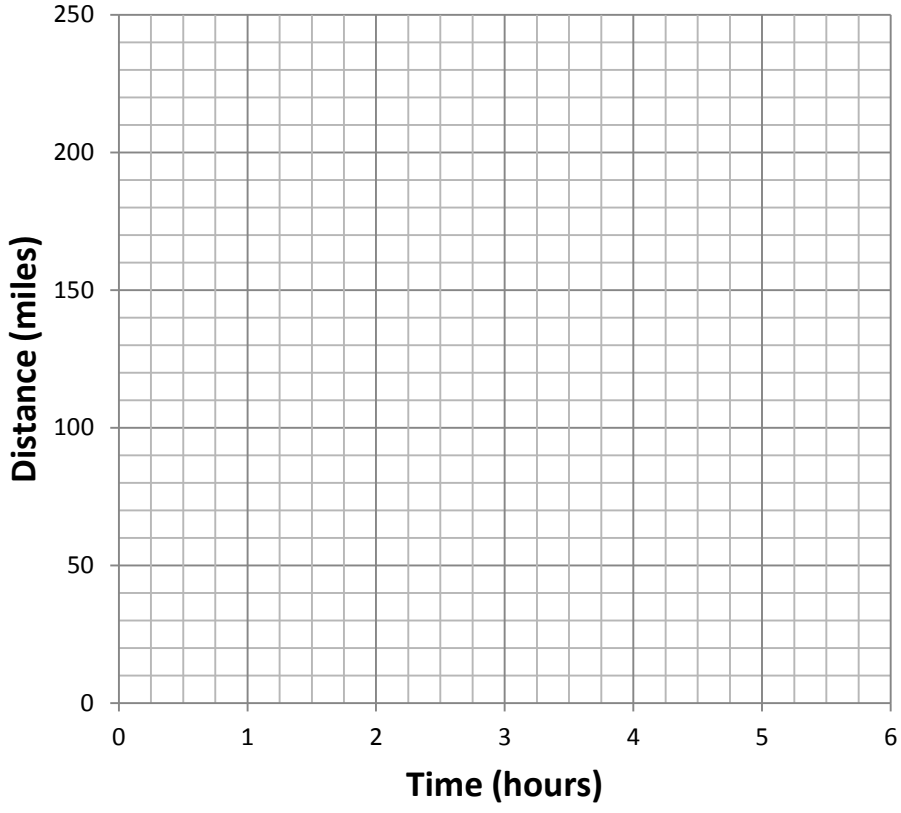
distance = _____ m

Q3. a) Use the grids provided below to sketch graphs for the following motions.

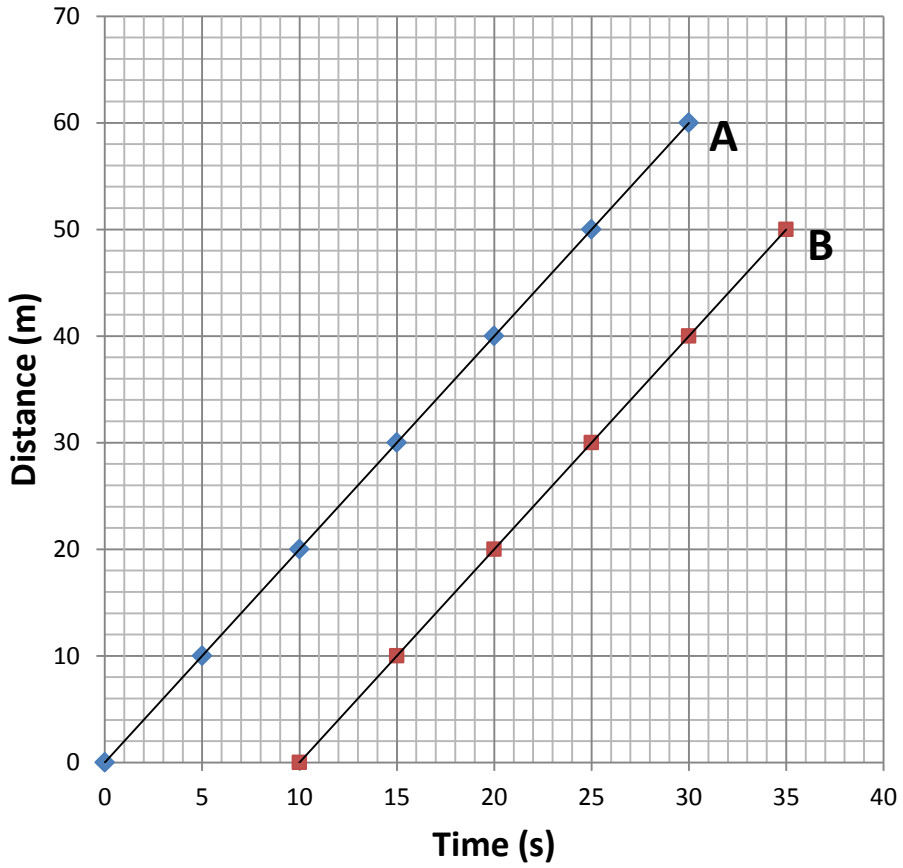
(i) The journey of a man who walks 6 miles in two hours then rests for one hour before running 21 miles in three hours. **(3)**



(ii) The journey motorcyclist who travels at 30 mph for two hours then rests for 45 minutes before carrying on at 60 mph for three hours. **(3)**



b) Use the graph provided below to calculate the speeds for objects A and B.



(i) Speed of object A (you **must** show your working out) **(3)**

speed of object A = _____ m/s

(ii) Speed of object B (you **must** show your working out) **(3)**

speed of object B = _____ m/s

Q4. A certain 3-D printer uses 1.26 m of filament in 1.5 hours.
Calculate the speed at which the filament is moving through the printer.
Give your answer in millimetres-per-second. **(4)**

speed = _____ mm/s

Q5. Peter leaves home at 3pm and travels to his mum's house.
The journey normally takes half an hour at an average speed of 20 m/s.
Today, however, there is heavy traffic and his average speed is only 15 m/s.
At what time will Peter arrive at his mum's house today? **(6)**

arrival time is _____

Q6. This question is about acceleration calculations.

a) Identify the equation below that shows the correct relationship between velocity, time and acceleration.

Put a cross (☒) in the box next to your answer. **(1)**

- ☒ **A** acceleration = change in velocity / time
- ☒ **B** acceleration = change in velocity / time^2
- ☒ **C** acceleration = change in velocity x time
- ☒ **D** acceleration = change in velocity x time^2

b) Calculate the acceleration for a motorcycle that takes 5.3 s to increase its velocity from 20 m/s to 50 m/s. **(3)**

acceleration = _____ m/s^2

c) Calculate the acceleration of an aircraft that takes 0.3 minutes to reduce its velocity from 185 m/s to 38 m/s on landing. **(4)**

acceleration = _____ m/s^2

d) Calculate the final velocity of a cyclist who is initially cycling at 18 m/s before pushing harder to maintain an acceleration of 0.6 m/s^2 for 40 s. **(4)**

final velocity = _____ m/s

Q7. A group of students is attempting to measure the speed of a model car by timing it over two different distances.

They repeat their measurements and obtain the following results.

Distance (m)	Time recorded for each test run (s)					Mean time (s)	Mean speed (m/s)
	Run 1	Run 2	Run 3	Run 4	Run 5		
1	0.47	0.42	0.52	0.50	0.74		
2	0.68	0.66	0.72	0.71	0.69		

a) Calculate the average (mean) time for each distance.
Write your answers in the table using appropriate significant figures. **(4)**

b) Use the mean time to calculate the average (mean) speed for each distance.
Write your answers in the table. **(2)**

c) Suggest a reason why the two calculated speeds are different. **(1)**

_____

d) Explain which speed is likely to be more accurate. **(2)**

_____

_____

_____

_____

Q8. This question is about the effects of forces on objects that are in motion.

a) State the names of three forces that act on a projectile. **(3)**

(i) _____ (ii) _____ (iii) _____

b) Describe the two possible states of motion for any object that has no unbalanced forces acting on it. **(2)**

(i) _____

(ii) _____

- End of Test Paper -