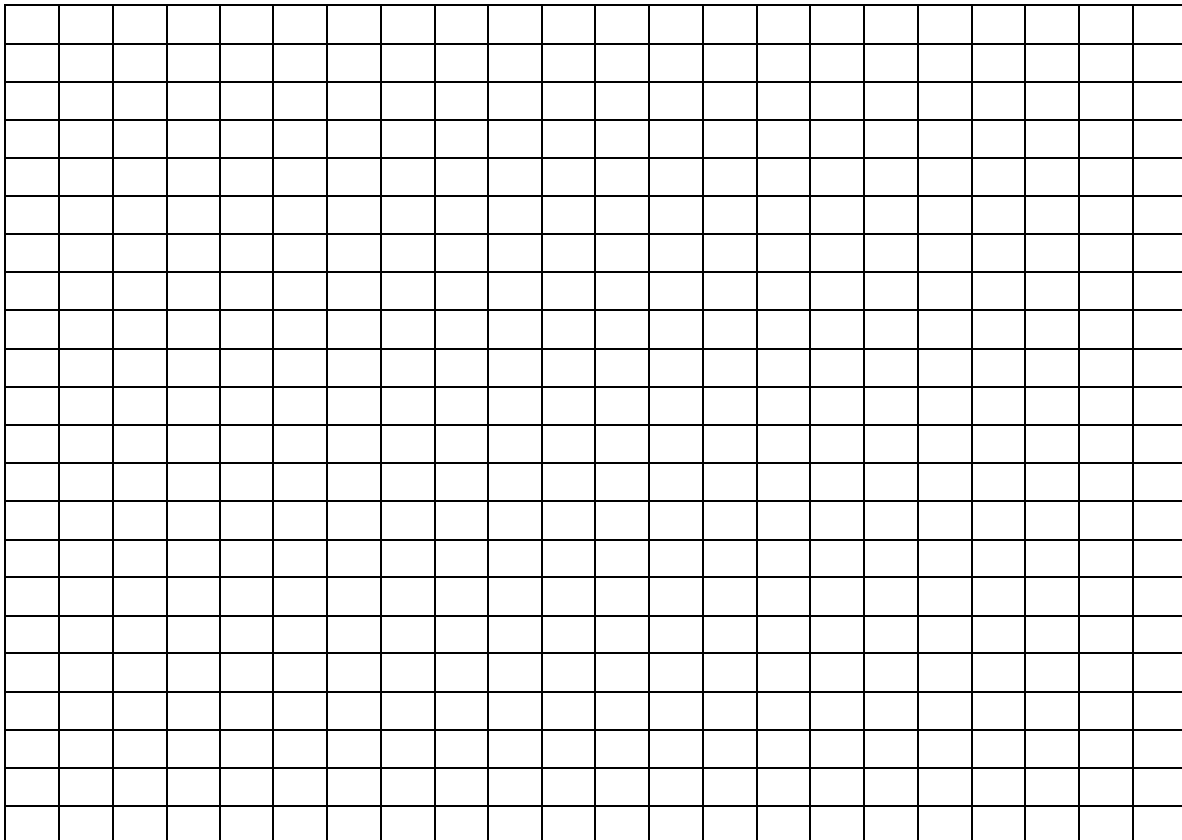


## Force and Motion: Investigation #3 Additional Problem Speed Graphs

**SHOW YOUR WORK!!**

1. a) Construct a graph of the data given in the table below.

<u>Rabbit</u>	<u>t (s)</u>	<u>d (m)</u>
Thumper	90	50
Cottontail	110	80



b) Using the graph, which rabbit runs the fastest? How do you know?

2. A Motorcycle Race:

Four motorcyclists wanted to figure out whose motorcycle was the fastest, so they collected the distance and time data shown in the table.

<u>Motorcycle</u>	<u>t (s)</u>	<u>d (m)</u>
1	40	1200
2	45	1400
3	70	2000
4	30	1000

a. List the motorcycles from fastest to slowest:

\_\_\_\_\_ (fastest)

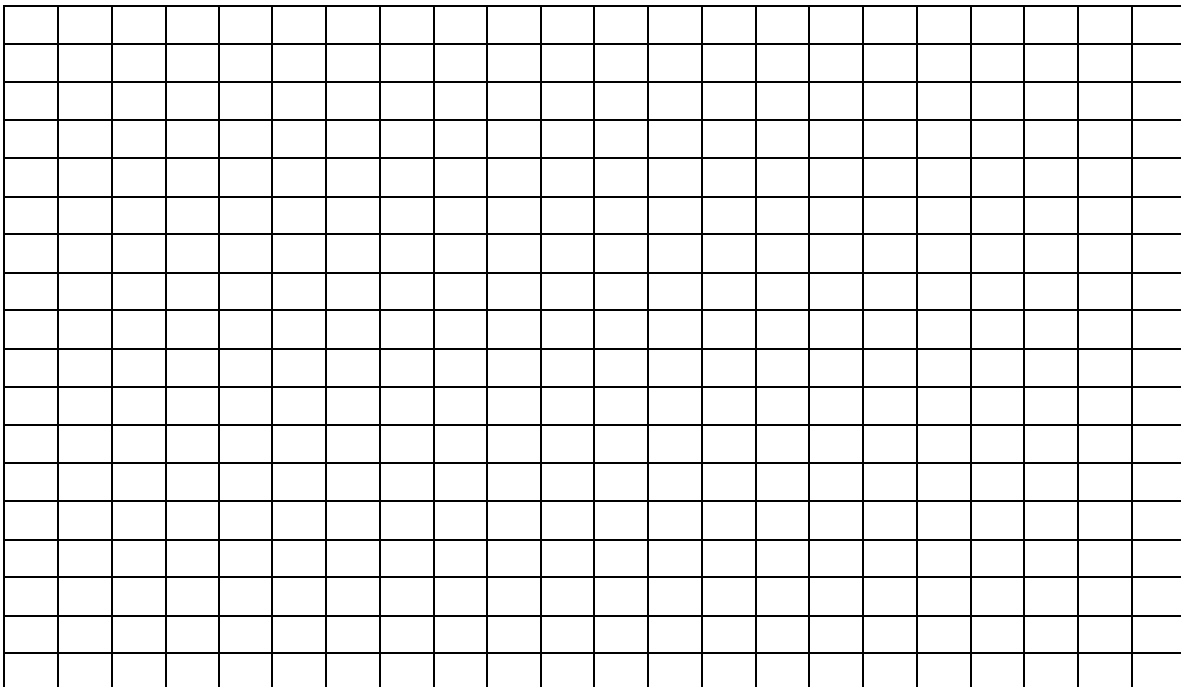
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ (slowest)

b. How far will each rider travel in 10 min?

c. Construct a graph and plan a race where all the motorcycles will cross the 1000 meter mark at the same time?



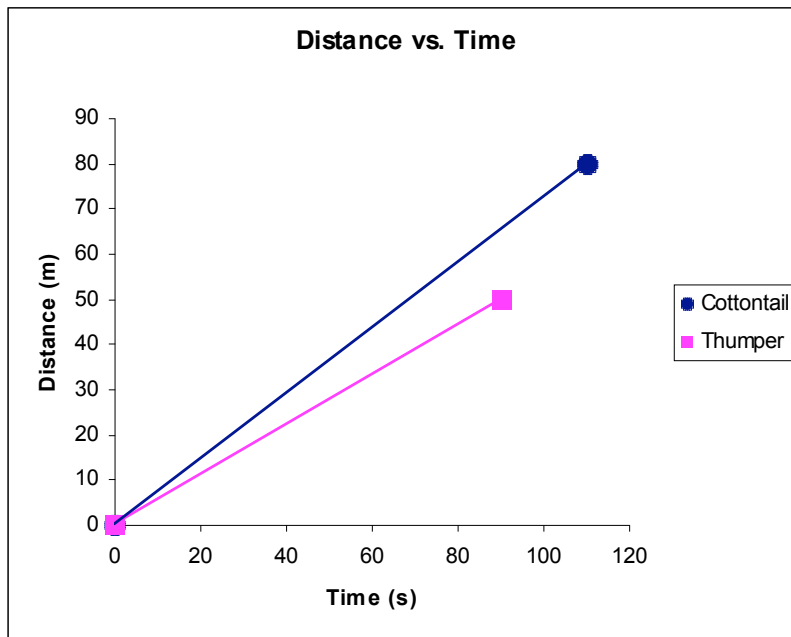
## KEY

### Force and Motion: Investigation #3 Additional Problems Speed Graphs

#### SHOW YOUR WORK!!

1. a) Construct a graph of the data given in the table below.

<u>Rabbit</u>	<u>t (s)</u>	<u>d (m)</u>
Thumper	90	50
Cottontail	110	80



b) Using the graph, which rabbit runs the fastest? How do you know?

Cottontail runs faster than thumper because cottontail's line is steeper than thumper's line.

On a distance time graph, the steeper the line, the faster the average speed.

#### **SHOW YOUR WORK!!**

2. A Motorcycle Race:

Four motorcyclists wanted to figure out whose motorcycle was the fastest, so they collected the distance and time data shown in the table.

<u>Motorcycle</u>	<u>t (s)</u>	<u>d (m)</u>
1	40	1200
2	45	1800
3	80	2000
4	30	600

a. List the motorcycles from fastest to slowest:

Motorcycle 2 (fastest)

Motorcycle 1

Motorcycle 3

Motorcycle 4 (slowest)

b. How far will each rider travel in 10 min? 10 min = 600 s

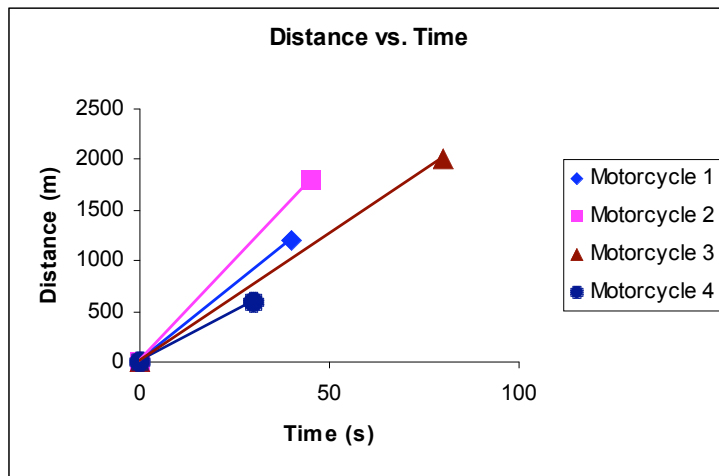
Motorcycle 1:  $v = d/t = 1200 \text{ m}/40 \text{ s} = 30 \text{ m/s}$  ;  $d = v \times t = 30 \text{ m/s} \times 600 \text{ s} = 18,000 \text{ m}$

Motorcycle 2:  $v = 1800 \text{ m}/45 \text{ s} = 40 \text{ m/s}$  ;  $d = 40 \text{ m/s} \times 600 \text{ s} = 24,000 \text{ m}$

Motorcycle 3:  $v = 2000 \text{ m}/80 \text{ s} = 25 \text{ m/s}$  ;  $d = 25 \text{ m/s} \times 600 \text{ s} = 15,000 \text{ m}$

Motorcycle 4:  $v = 600 \text{ m}/30 \text{ s} = 20 \text{ m/s}$  ;  $d = 20 \text{ m/s} \times 600 \text{ s} = 12,000 \text{ m}$

c. Construct a graph and plan a race where all the motorcycles will cross the 2000 meter mark at the same time?



Time head start: All

Motorcycles begin at start position

Start Motorcycle 4 and the stopwatch first.

After 20 s, start motorcycle 3.

After 33.33 s, start motorcycle 1.

After 50 s, start motorcycle 2.

Distance head start: All

motorcycles start at the same time

Position Motorcycle 2 at the

start.

Give Motorcycle 1 a 500 m head start.

Give Motorcycle 3 a 750 m head start.

Give Motorcycle 4 a 1000 m