YEAR 8 MATHEMATICS WEEK 12 2020 (TERM 1)

Year: 8 **Date: Wednesday 22 April 2020**

STRAND: NUMBERS **TOPIC: Rates**

LESSON OUTCOME: At the end of this lesson student(s) should be able to calculate rate and speed.

Instructions: Hi dear Parents/Guardians and students - In this Lesson students are going to rates and speed and do the selected questions for **Exercise 1.3**.

[*Note that all the Quizzes/Test and or Assignment will be based on the selected questions for each exercise. These lessons are designed for* ***one hour per Lesson****.]*

What to do: Do the following selected questions

Exercise 1.3: Q2 (All); Q6, Q9

Solutions: Solutions will be available online via
https://www.facebook.com/centralschoolemergencyforum/posts/108720557434149

7. Mary works for five days each week. She gets paid 14 000 vatu per week.
   What is her rate of pay per day?

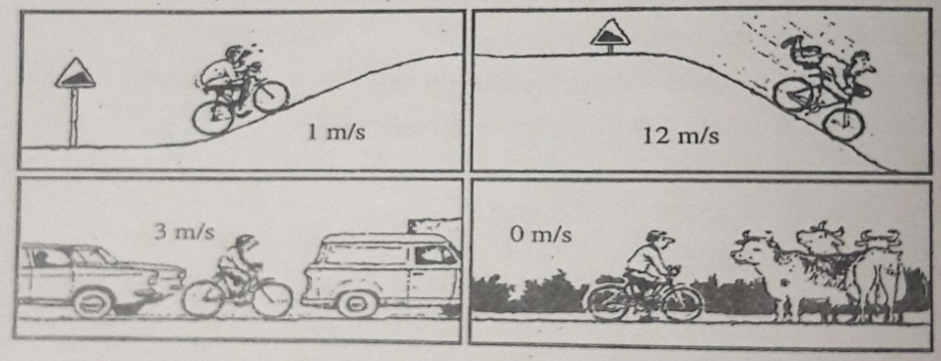
8. Sylvie earns 660 000 vatu per year. She gets the same amount each month.
   What is her rate of pay per month?

Rate and speed

The speed of an object is the rate at which the object is covering distance per unit of time.

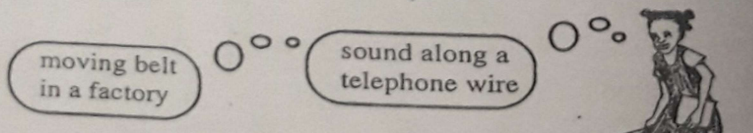
For example, kilometres per hour, metres per second.

An object which is travelling at the same speed is said to have constant speed.

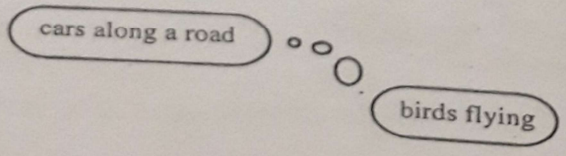


On a flat clear road it is possible to go at a constant speed, the same distance in each second.

Here are two things which normally travel at constant speed.



Here are two things which normally do not.



Example 1 How far do you go in 3 seconds at a constant rate of 7 m/s?

metres per second

Answer: rate is 7 m for 1 second

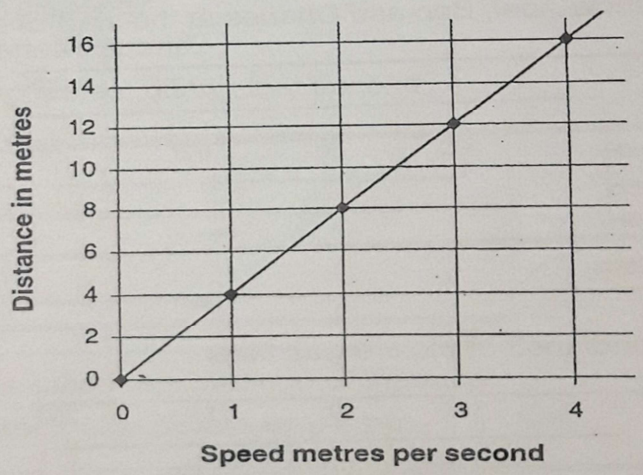
means that 7 metres is travelled each second

Therefore, 21 metres is travelled in 3 seconds.

Example 2 How many days would it take you to walk 500 km at a speed of 20 km per day?

Answer: rate is 20 km for 1 day.
To walk 500 km, you take
(500 ÷ 20) days
= 25 days.

Example 3 The following graph shows Pakoa running at a constant speed of 4 m/s.



(a) How far has Pakoa gone in $\frac{1}{2}$ second?

Answer = 2 metres.

(b) How far has Pakoa gone in $3\frac{1}{2}$ seconds?

Answer = 14 metres.

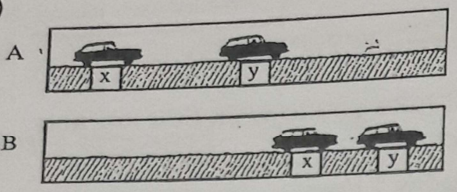
(c) How long will he take to run 10 metres?

Answer = $2\frac{1}{2}$ seconds.

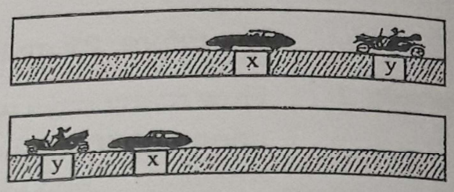
Exercise 1.3

1. Here are some pictures of two cars x and y.
Picture B was taken 1 second after picture A. In each case, which car was going faster, x or y?

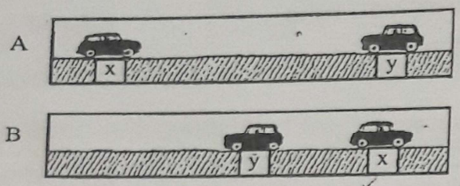
(a)



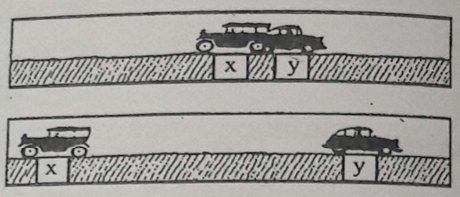
(b)



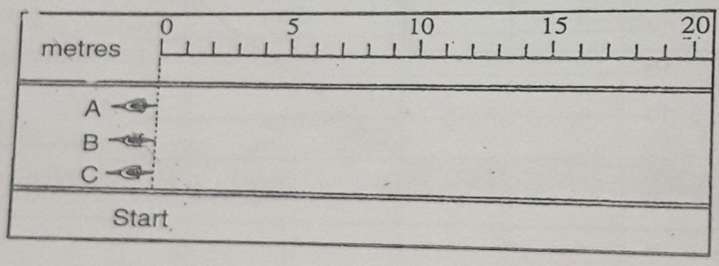
(c)



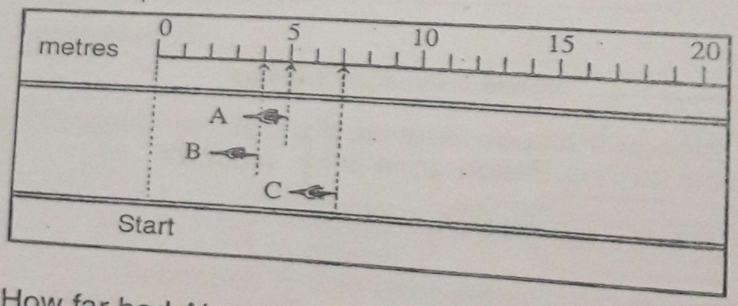
(d)



2. This picture show Abel, Ben and Charles at the start of a bicycle race.

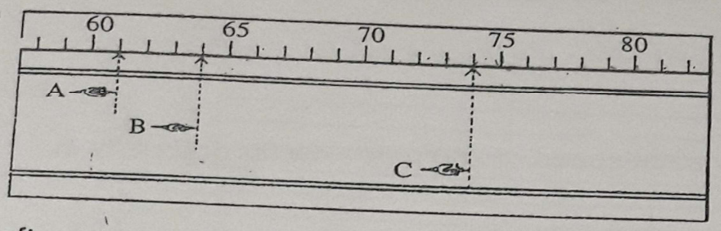


After one second another picture was taken.

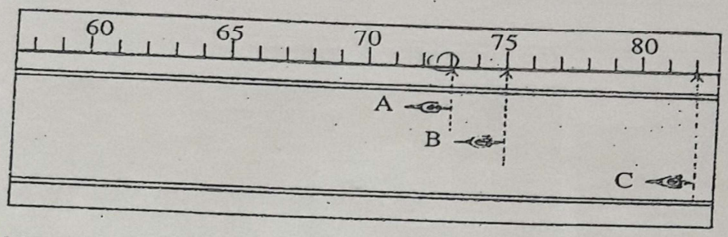


(a) How far had Abel gone in one second?
(b) How far had Ben gone in one second?
(c) How far had Charles gone in one second?
(d) Write down their speeds in m/s.

Later another picture was taken,



and after one more second, another one.



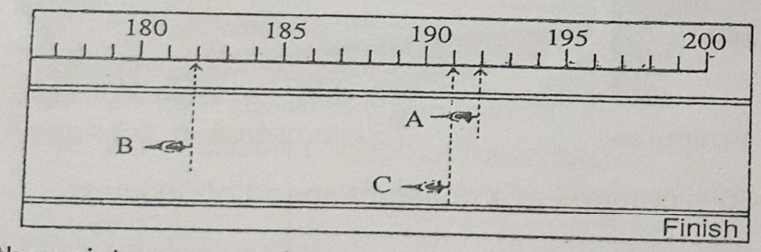
(e) How far did Abel go in that second?

(f) What was Abel's speed for that second?

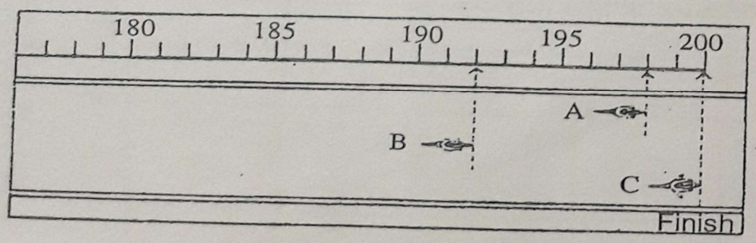
(g) What was Ben's speed?

(h) What was Charles's speed?

(i) Who was going fastest during that second?



Another picture was taken near the end of the race, and one second later a final picture was taken.



(j) Find the speed of each of the three cyclists.

(k) Who was fastest?

(l) Who won the race?

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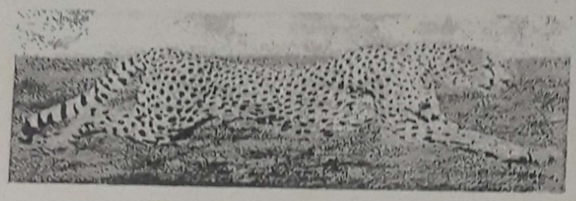
3. At a constant speed of 4m/s, how far do you go in:
   (a) 3 seconds
   (b) 5 seconds
   (c) 12 seconds?

4. A jet plane flies at a constant speed of 250 m/s. How far does it fly in 3 seconds?

5. Each of these travelled at a constant speed. What was the speed in each case?

(a) cheetah



540 metres in 20 seconds

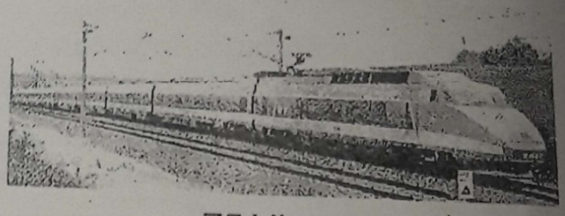
(b) marathon runner

120 metres in 30 seconds

(c) ski chair-lift

480 metres in 4 minutes

(d) high-speed train

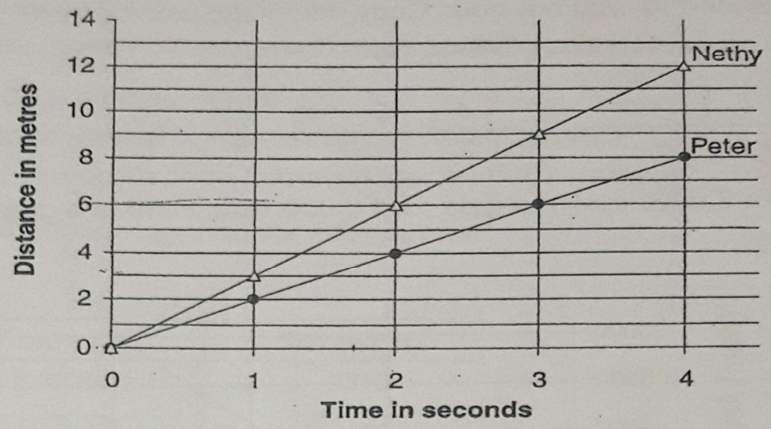


75 kilometres in 1/3 hour

6. An ocean liner travels 960 kilometres at a constant speed of 60 km/h. How long did it take?

7. Water flows into a tub at the rate of 36 litres/minute. The tub holds 180 litres. How long does it take to fill the tub?

8. Peter and Nethy go for a run. The following graphs shows their run.



(a) Who runs more quickly?
(b) How far does Nethy run in 1 second?
(c) How far does Nethy run in 2 seconds?
(d) What is her speed in m/s? ← metres per second
(e) What is Peter's speed in m/s?

9. The speed of three cyclists A, B and C are shown in the graphs below.
(a) Who is moving fastest?
(b) Who is moving the slowest?
(c) How far did A travel in 1 second?
(d) What is the speed of each of the cyclists?