MODUL 13
MATEMATIK SPM "ENRICHMENT"
TOPIC : GRADIENT AND AREA UNDER A GRAPH

MASA : 1 JAM

1 Diagram 1 shows the speed-time graph of a particle for a period of 15 s.

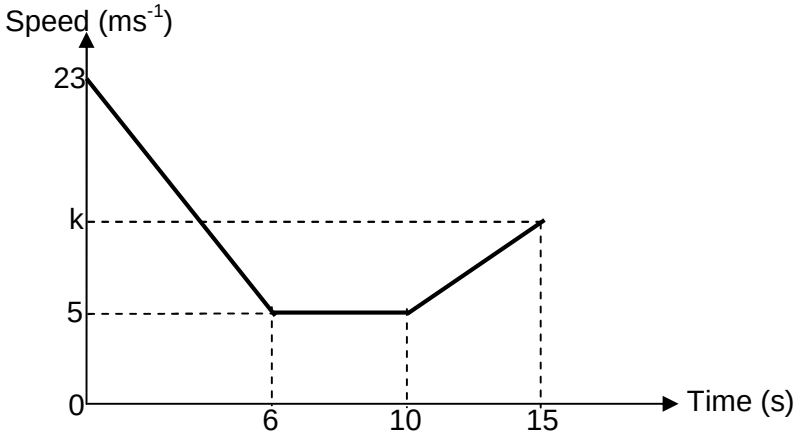

DIAGRAM 1

(a) State the distance, in m, the particle moves with constant speed.
(b) Calculate the rate of change of speed, in ms^{-2}, in the first 6 s.
(c) Calculate the value of k, if the total distance travelled in the first 15 s is 139m.

[6 *marks*]

Answer:

(a)

(b)

(c)

2. Diagram 2 shows the speed-time graph of two particles, α and β for a period of 8s.

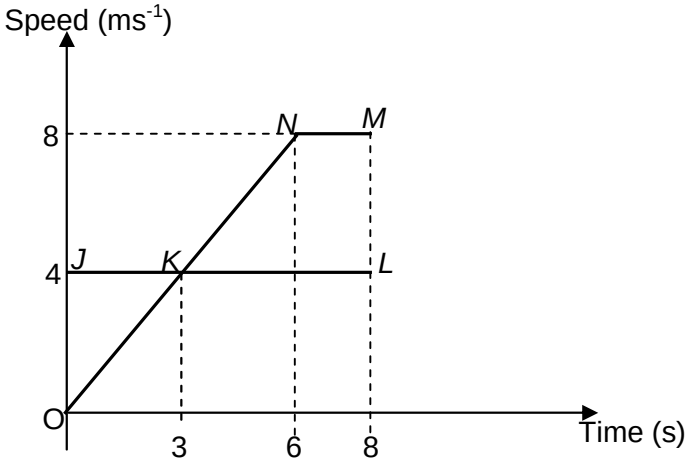

DIAGRAM 2

The graph *OKNM* represents the movement of particle α and the graph *JKL* represents the movement of particle β.Both particles start moving at the same time.

(a) State the length of time, in s, that particle α moves with uniform speed.
(b) Calculate the rate of change of speed, in ms^{-2}, of particle α in the first 6 s.
(c) Calculate the difference in distance, in m, of particle α and particle β for a period of 8 s.

[6 *marks*]

Answer:

(a)

(b)

(c)

3. Diagram 3 shows the distance-time graph of the journeys taken by Ali and Fuad.

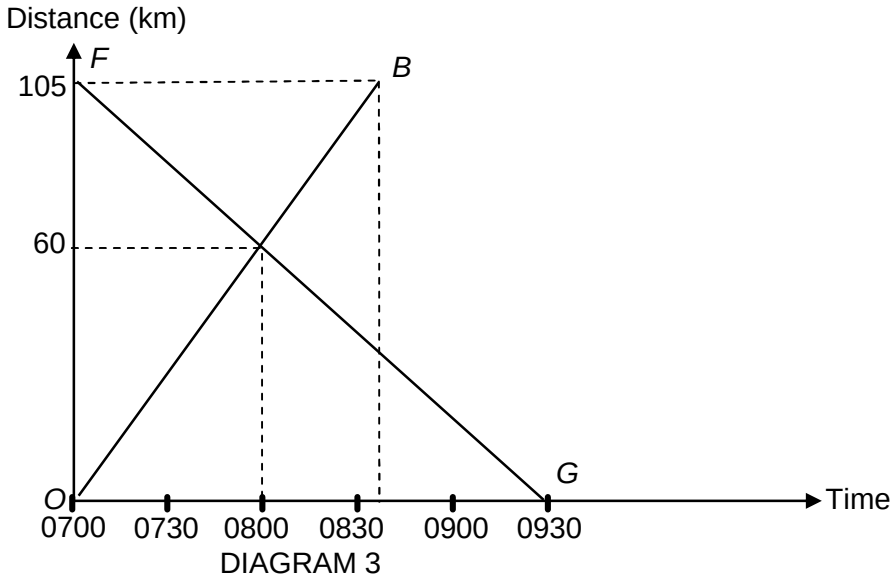

DIAGRAM 3

The straight line *OB* represents Ali's journey from town X to town Y, while the straight line *FG* represents Fuad's journey from town Y to town X.
Ali and Fuad uses the same route.

(a) State the distance, in km, of town Y from town X.
(b) Find the time Ali and Fuad meet each other during their journey.
(c) Find the distance when they meet from town Y.
(d) Calculate Fuad's speed.

[6 *marks*]

Answer:
(a)

(b)

(c)

(d)

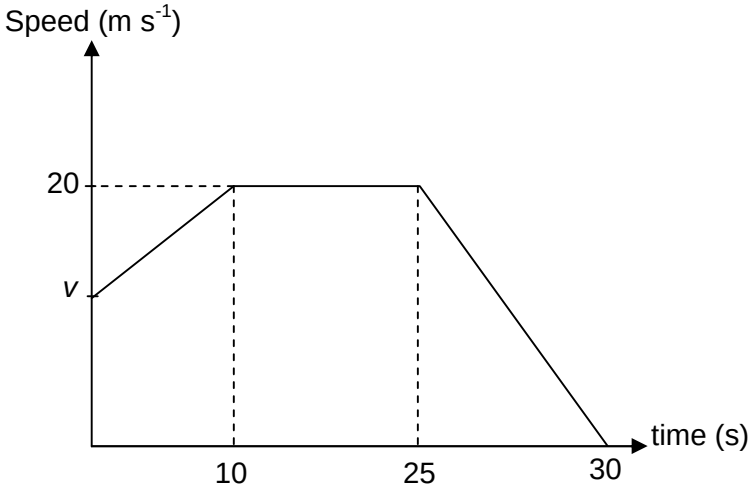

DIAGRAM 4

4. Diagram 4 shows the speed-time graph of a motorcyclist in a period of 30 seconds.
Given that the total distance travelled by the motorcyclist is 525 m.

Calculate,

(a) the rate of change of speed in the last 5 second,

(b) the duration of uniform speed,

(c) the value of *v.*

[6 *marks*]

Answer:

(a)

(b)

(c)

5. Diagram 5 shows a velocity-time graph for a particle.

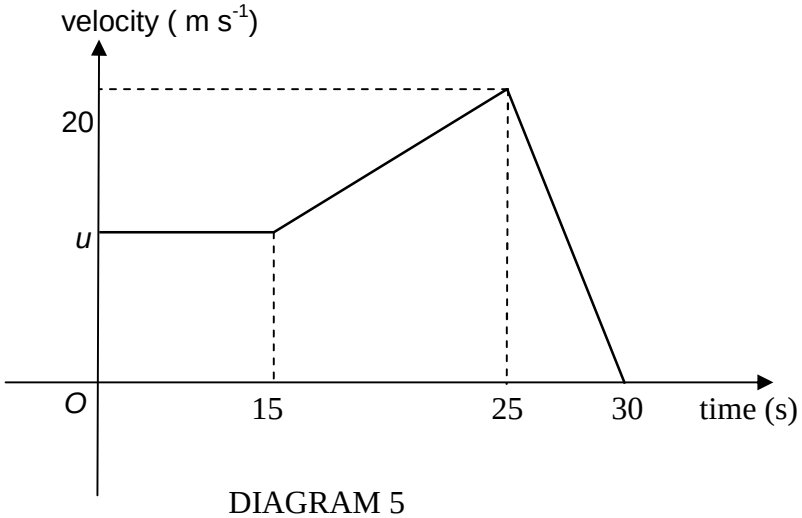

DIAGRAM 5

(a) State the time, in s, the particle moves with constant velocity.

(b) Calculate the accleration, in m s^{-2}, of the particle in the last 5 seconds.

(c) Find the value of *u* if the total distance travelled after 15 seconds is 190 m.

[6 *marks*]

Answer:

(a)

(b)

(c)

6. Diagram 6 shows a displacement – time graph for the journey of a car from town *A* to town *C* passing town *B* and then back to town *A*.

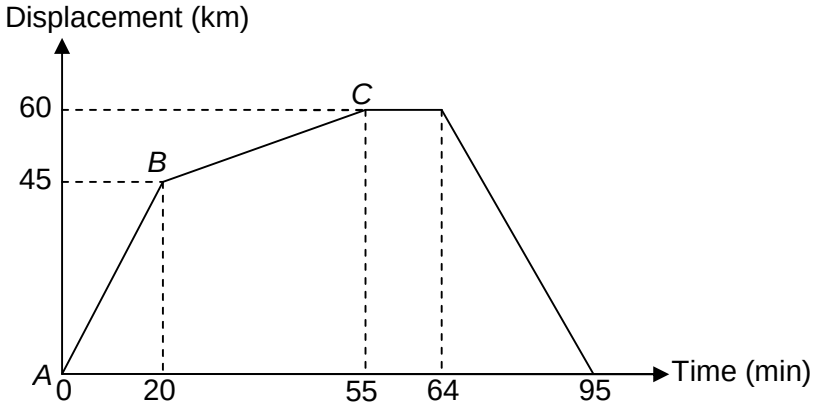

DIAGRAM 6

(a) Calculate the speed in km/h for the journey from town *A* to town *B.*

(b) State the time taken for the car to stop at town *C.*

(c) Calculate the average speed in km/h for the total distance of the car.

[6 marks]

Answer:

(a)

(b)

(c)

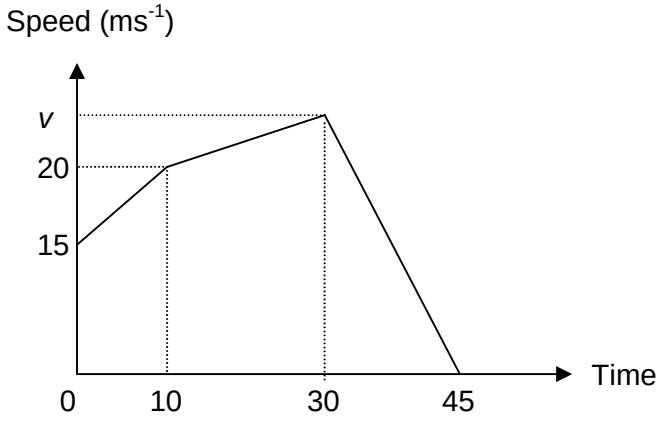

Diagram 8

8 Diagram 8 shows the speed-time graph of a particle for a period of time 45 seconds.

(a) Calculate the rate of change of speed, in cm^{-2}, in the first 10 seconds.
(b) Calculate the value of *v*, if the total distance traveled in the last 35 seconds is 725 m.

Answer:

(a)

(b)

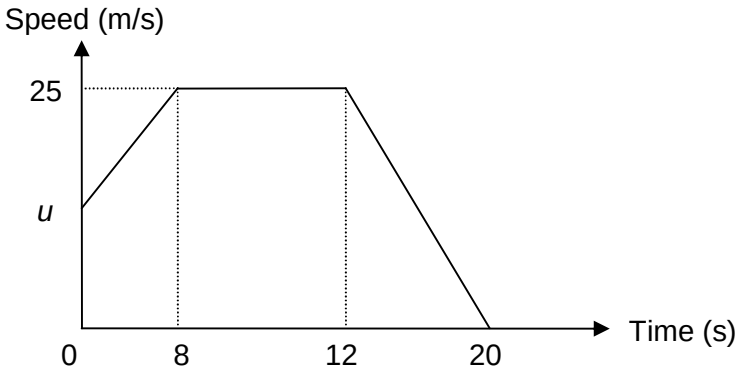

Diagram 9

9. Diagram 9 shows the speed-time graph of a particle for a period of 17 seconds.

   (a) Calculate the value of *u,* if the total distance traveled in the first 8 seconds is 164 meters.

   (b) State the length of time, in s, that particle move with uniform speed.

   (c) Calculate the rate of change of speed, in m s^{-2}, for a period of 20 second.

Answer:

(a)

(b)

(c)

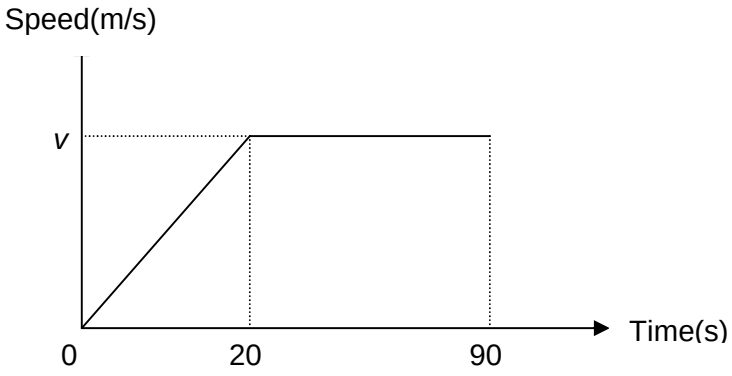

Diagram 10

10 Diagram 10 shows the speed-time the speed-time graph of a particle for a period of 90 seconds.

(a). Calculate the value of *v*

(b). Calculate the distance for the first 50 seconds

Answer:

(a)

(b)

MODULE 13 - ANSWERS
TOPIC : GRADIENT AND AREA UNDER A GRAPH

1 (a)	20	1
(b)	$\frac{23-5}{0-6}$ –3 atau nyahpecutan 3 atau awapecutan 3	1 1
(c)	$\frac{1}{2}\times 6(23+5) + 4\times 5 + \frac{1}{2}\times 5(5+k) = 139$ k = 9	2 1

2(a)	2 saat	1	
(b)	$\frac{8-0}{6-0}$	1	
	$\frac{4}{3}$ *atau* setara	1	
(c)	$\frac{1}{2}\times 8(2+8)$	1	
	$\frac{1}{2}\times 8(2+8)-4\times 8$	1	
	8	1	**6**

3 (a)	105 km	1	
(b)	0800 a.m	1	
(c)	105 – 60 = 45km	1 1	
(d)	$\frac{105}{2.5} = 42 km/j$	1 1	6

4	(a) $\frac{0-20}{30-25}$ $-4\,ms^{-2}$ (b) 5 *s* (c) $\frac{1}{2}\times 10\times(v+20)+\frac{1}{2}\times 20\times(15+20)=525$ $v=12\,ms^{-1}$	1 1 1 2 1	**6**

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5	(b) 15 (b) $\frac{20-0}{25-30}$ -4 (c) $\frac{1}{2}\times(u+20)\times 10+\frac{1}{2}\times 5\times 20=190$ *u* = 8	1 1 1 2 1	**6**

6 (a)	20	1
(b)	$\frac{23-5}{0-6}$ –3 atau nyahpecutan 3 atau awapecutan 3	1 1
(c)	$\frac{1}{2}\times 6(23+5)\ +\ 4\times 5\ +\ \frac{1}{2}\times 5(5+k)=139$ k = 9	2 1

7	(c) $\frac{45}{20/60} =$ 135 km/jam (b) 9 minit @ $\frac{3}{20}$ jam @ 0.15 jam (c) $\frac{120}{95/60} = 75.79\ km/jam$	1 - 1 1 2- 1	**6**