Class IB_1

Physics

Friday october 2024

Test 1

Total: / 35 marks

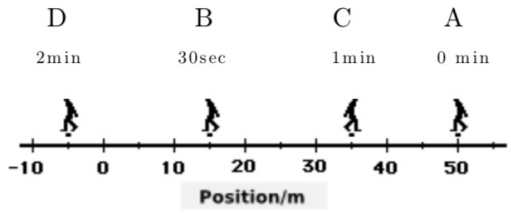
name : _____

Problem 1 *[12 marks]*

A football coach paces back and forth along the sidelines. The diagram below shows several of the coach's positions at various times. At each marked position, the coach makes a "U-turn" and moves in the opposite direction.

Un entrenador de fútbol camina de un lado a otro por la banda. El siguiente diagrama muestra varias de las posiciones del entrenador en distintos momentos. En cada posición marcada, el entrenador hace un "giro en U" y se mueve en la dirección opuesta.

フットボールのコーチがサイドラインに沿って行ったり来たりしている。下の図は、さまざまな時点でのコーチのポジションのいくつかを示しています。マークされた各位置で、コーチは「U ターン」を行い、反対方向に移動します。



(In other words, the coach moves from position A to B to C to D.)

1) What is the coach's resulting *displacement* ?

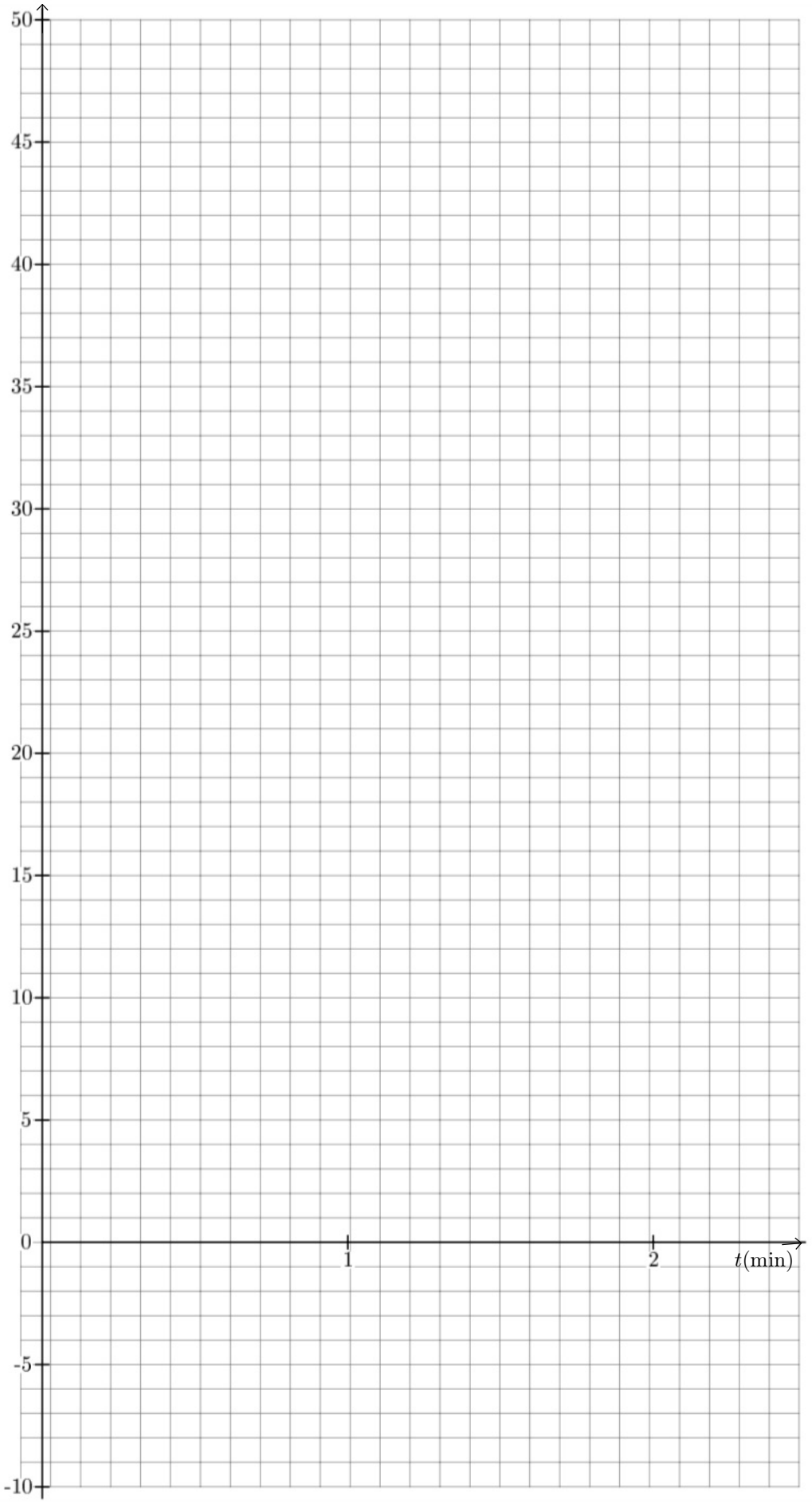
2) What is his *total distance* of travel ?

3) What is his average *speed* ?

4) What is his average *velocity* ?

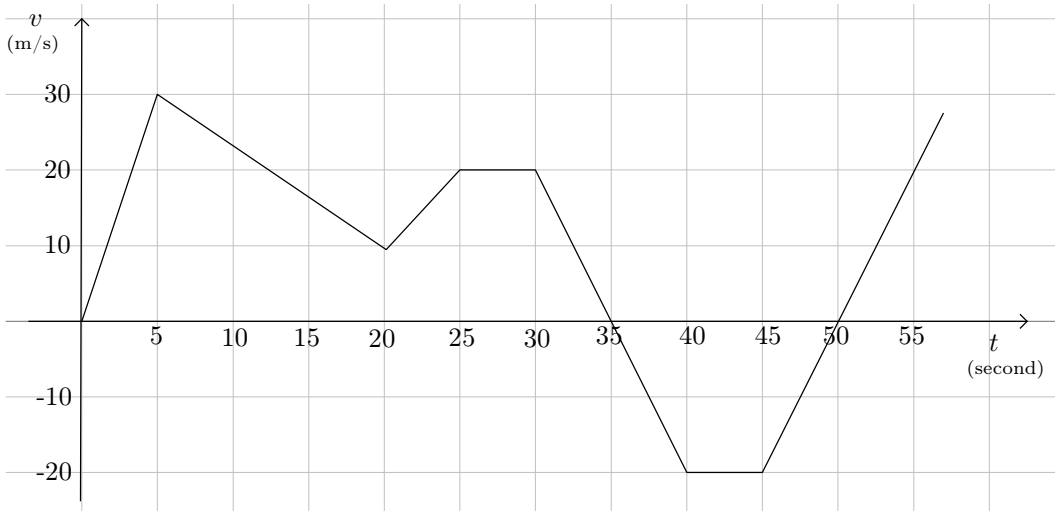
5) On the next page, draw a graph for the position of the coach versus time.

Could we say that this motion is at a *constant speed* ?


50
45
40
35
30
25
20
15
10
5
0
-5
-10
1
2
t(min)

Question 2 *[9 marks]*

The following graphics shows the ***velocity*** of a bicycle walking on a road for t between 0 and 55s



[Hint : *For the question 2 you will have to convert unit km/h in an other unit !*]

1) What is the *velocity* of the bike at $t = 20\,\text{sec}$? [/1]

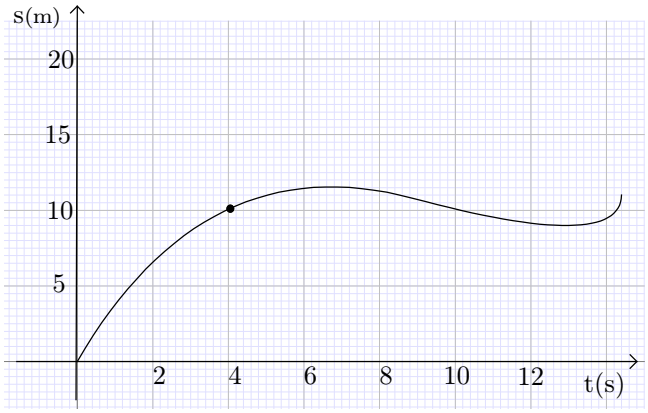
2) Estimate when, for the third time the velocity of the bike reaches 90 km/h ? [/2]

3) What is the *displacement* of the bicycle for $0 \leqslant t \leqslant 30\,s$? [/3]

5) What is the *average velocity* of the bike for $0 \leqslant 1 \leqslant 45\,s$? [/3]

Question 3 *[8 marks]*

The position of a skate is given by the graphics below



1) What is the *position* of the skate at $t = 4s$?

2) What is the *average velocity* between $t = 0$ and $t = 10\,\text{sec}$?

3) What is the *velocity* at $t = 4\text{sec}$?

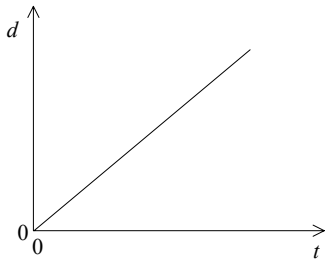
4) What is the *sign of the speed* at $t = 10\,s$?

Question 4

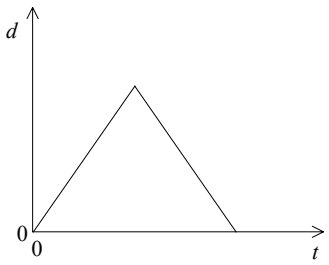
[2 marks]

An athlete runs round a circular track at constant speed. Which **one** of the following graphs best represents the variation with time t of the magnitude d of the **displacement** of the athlete from the starting position during one lap of the track?

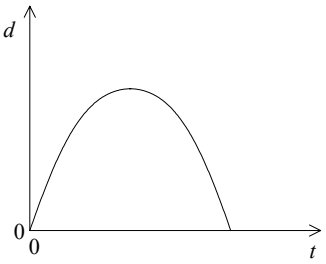
A.



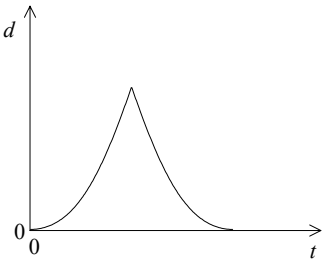
B.



C.



D.



Question 5

[4 marks]

Calculate the *average speed* of the object between 0 and 7s