Speed time graph worksheet gcse

With the speed on the Y axis and the time on the X axis, a speed time chart tells us how someone's speed/something has changed over a period of time. 1) Line gradient - Acceleration 2) Negative gradient - Deceleration 3) Flat section means constant speed (NOT STOPPED) 4) The area below the graph - Distance traveled A skill you will need to learn is to describe a speed time chart. Example: The speed time graph shows a 50-second drive. Describe the 50-second journey. Step 1: Divide the chart into different sections, these can be seen in the image as A, B, C and D. Step 2: In detail describe each part of the trip, making sure to use numeric values throughout. Section A – The car accelerated from 0 to 15 m/s for the first 10 seconds (because the line is straight, acceleration is constant). Section B – The line is flat, which means that the car speed did not change for 10 seconds, which means it was moving at a constant speed. Section C – The car accelerated up to 25 m/s over the next 10 seconds, Section D – finally spent the last 20 seconds slowing down again to 0 m/s. Acceleration is calculated as the change in speed over time. Example: The speed time chart shows a 50-second drive, finding which section of the chart has the highest acceleration. We know, The gradient of the line - Acceleration We must find the gradient of each section. Section .bf-A: Acceleration between 0s and 10s - gradient- dfrac- 15-0-10-0-1.5 m/s-2 Section .bf-B: This section is flat, which means that acceleration will be 0 Section .bf-C: Acceleration between 20s and 30s - gradient . 5-30-20-1 m/s-2 Section .bf-D: Acceleration between 30s and 50s - gradient -dfrac-0-25-50-30-dfrac-25-{20} -1.25 m/s/s section bf á -A- has the largest acceleration, It has the largest acceleration, so the maximum acceleration is 1.5 m/s2 Note: the acceleration units are expressed in distance/time-bold-2o, which in this case is m/s-bold-2o. Calculating the total distance traveled is one of the most common exam questions you can see. Example: The speed time chart shows a 50-second drive, Calculate the total distance traveled during the 50 seconds. we know, area below the chart - Distance traveled To work the area below this chart, we will divide it into 4 shapes: A, B, C and D. This gives two triangles, a rectangle and a trapeze, which are all ways we can work the area. .text-A-dfrac{1}{2}-times10'times15'75 m'text', 'B'10', 'times15'150 m' C'drac{1}{2}(15+25', 'times10'2' M D-dfrac{1}{2}-times20-times25-250 m Total distance travelled: 75+150+200+250-675 m Find the average gradient, is the gradient for a period of time. Example: A speed time chart of someone's first 4 seconds is displayed a career. Calculate the average acceleration over the 4 seconds. We know: The gradient of the line - Acceleration To work the average acceleration during the 4 seconds, we will draw a line from where the chart is in 0 s to where the chart is at 4 seconds and we will find the of hers. Therefore, we get the average acceleration, text (text), gradient (gradient) and dfrac (drac) 6-0(0-0-1.5 m/s-2 Find the instant gradient, is the gradient of the tangent at a point. Example: A speed time chart of the first 4 seconds of someone running a race is displayed. Calculate instant acceleration 2 seconds in. To do this we will draw a tangent to the line after 2 seconds and solve the gradient of that. This is shown above. Next, we get instant acceleration, text (text), gradient (gradient), and dfrac (dfrac) 5.8-3,2, 3.5- 1.0, and 1.04 m/s2 (3 sf). Therefore, first let's draw a line from the origin to (12, 4), since after 12 seconds, it is reached at 4 m / s. Then, for the next part we are told that the deceleration is 0.1 m/s2 for 20 seconds. Therefore, if the speed decreases by 0.1 every second, after 20 seconds it will be 0.1 times 20 x 2 m /s Therefore, by 32 seconds in the speed is 2 m / s, so let's draw a straight line from (12, 4) to (32, 2). Finally, a constant speed will be represented by a flat line that goes to the point of 50 seconds, still at 2 m/s. The result should look like the following graphic. We need to find the area below the chart. To do this, we'll divide it into shapes that we know how to calculate the area from, as seen below. A is a triangle, B and C are trapezoids, and D is a rectangle. Therefore, we get text from the text page of A{1}{2},times10, times15, text, text, B, dfrac{1}{2}, times (10 +15), times5, 6 2.5 m .text ,C , dfrac{1}{2},times(10+20), times5, 75 m, text, D, 30 times, 600 m therefore, the total distance traveled by the cyclist is 75+62.5+75+600-812.5 m To determine the average acceleration, we draw a line from the origin to the end point of the chart, as seen below. The mean acceleration is given by the gradient of this line. Therefore, the average acceleration is, text, gradient, dfrac 4-0, 50.0, 0.08 m/s2 Try a revision card on this topic. Level 4-5 1) The gradient of the line - speed 2) A flat section means that there is no speed (stop) 3) The steeper the graph, the higher the speed 4) Negative gradient - return to the start point (return) The following chart describes a route that has multiple parts to it, each represented by a different straight line. Part A: 09:00 - 11:00o, the person traveled 30 km away from their starting point and that took them 2 hours. Part B: bf11:00 - 12:00, we can see that the line is flat, so the distance from its starting point did not change – they were stationary. Part C: Bf-12:00 - 12:30o, moved another 30 km away from their starting point. Part D: Bf-12:30 - 14:00, traveled the 60 km back to where they started. Calculate speed – for each part of the trip: text , dfrac, text, Distancia (D) , texto, Tiempo (T) , Parte A:11:00'texto''''''''''{30}{2}''{0}{1} a 0 km/h (No se mueve) Parte C: .bf-12:00 - 12:30'texto''''''''''{30}''60 km/h Parte D: .bf-12:30 - 14:00''texto'''Velocidad'{60}'' 14:00''texto'''Velocidad'{60}'' we can see that the person traveled faster over the part C. Valentina is going for a bike ride. Below is a distance chart describing your entire journey. a) How long were you standing? b) What was the total distance traveled during your trip? c) What was your average speed in kilometers per hour between 17:15 and 17:45? [3 marks] a) We can see that the chart was flat for the duration of a large square. From the axis, we can see that two large squares add up to 15 minutes, therefore a large square is worth 7.5 minutes, so it was stopped for 7.5 minutes. b) Valentina traveled 25 km away from home, stopped briefly, and then traveled 25 km back home. Therefore, he traveled 50 km in total. c) We need to calculate the chart gradient between 17:15 and 17:45. This period lasted 30 minutes, which equates to 0.5 hours – this is the change in x. During this period, he increased his distance from home from 5 km to 25 km, meaning he traveled 20 km in total – this is the change in y. Therefore, we get the text page text from the text page of the text page of the text page of the text page of the text page of the text page of the {20} page from 0.5 to 40 km/h, making the above words seem more readable, we get: 12:00 - 13:30, travel from 0 miles away to 44 miles away; 13:30 - 16:30, stays in one place; From 16:30 to 18:30, travel 44 miles away 0 miles away. On a chart, this looks like: Looking at the chart, we can see that it runs at three different speeds during different parts of the race. The chart becomes less steep in the middle, so it won't be your maximum speed period, and the other two are hard to distinguish just by looking, so let's work both. Período 1: texto, Gradient Gradient Gradiente - s-dfrac-texto-distancia recorrida-texto-tiempo tomado-''distancia recorrida, texto, tiempo tomado, por lo tanto, la velocidad más rápida recorrida por Chris durante la carrera fue de 8,33 m/s, a 3 sf. (a) Travel distance is, Text Total distance, 48 + 10 x 58 km (b) Stopped for 30 minutes to the mark of 32 km. The gradient of a distance time chart is speed. Therefore, to find the fastest average speed we must find the steepest section of the chart. This is the final section covering 48 km in one hour, therefore text top speed, 48 km/h Try a review card on this topic. These worksheets are designed for IGCSE PHYSICS students. AS Level students may find them useful as part of their preparation for the KINEMATICS theme. You can such as class assignments or tasks in order to also guide the course for future teaching and learning. Read moreFreeReport an issue Designed for the AQA GCSE 9-1 specification. I teach the subject over two lessons so as not to ensure a complete understanding. The goals of the lesson include Understanding How to Measure Speed Changes. Understand what a horizontal line tells you on a speed time chart. Understand how to use a speed time graph to find out if an object is accelerating or decelerating. Understanding Understanding the area under a speed time chart tells you (Higher) (higher)