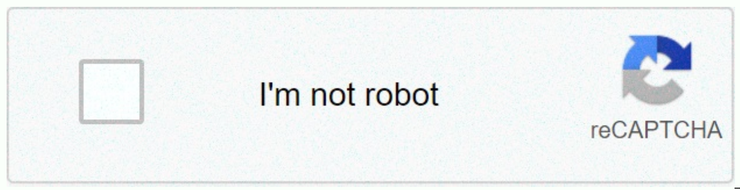

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Interpreting speed time graphs worksheet

With speed on the y-axis and time on the x-axis, the speed time schedule will tell us how something/something speed has changed over time. 1) Line gradient = acceleration 2) Negative gradient = deciant 3) Flat section means constant speed (NOT STOP) 4) Area according to schedule = Distance travelled One skill you will need to learn describes the speed time schedule. Example: The speed time schedule shows a 50-second journey by car. Describe the 50-second journey. Step 1: Divide the chart into separate sections and see the image as A, B, C, and D. Step 2: Describe each part of the journey in detail to ensure that numeric values are used. Section A – The car has run from 0 to 15 m/s in the first 10 seconds (because the line is straight, the acceleration is constant). Section B – The line is flat, which means that the speed of the car has not changed for 10 seconds, which means that it has been moving at a constant speed. Section C - The car accelerated to 25 m/s in the next 10 seconds, Section D – Finally it spent the last 20 seconds slowing back to 0 m/s. Acceleration is calculated as a change in speed over time. Example: The speed time schedule shows a 50-second journey in a car with the highest acceleration in the schedule. We know the gradient of the line = acceleration We have to find a gradient for each section. Section \bf{A}: Acceleration from 0s to 10s = gradient=\dfrac{15-0}{10-0}=1.5 m/s^2 section \bf{B}: this section is flat, means that acceleration will be 0 Section \bf{C}: acceleration from 20s to 30s = gradient =\dfrac{25-0 15}{30-20}=1 m/s^2 section \bf{D}: Acceleration 30 to 50s = gradient =\dfrac{0-25}{50-30}=\dfrac{-25}{20} = -1,25 m/s^2 section \bf{A} has the largest, maximum acceleration is therefore 1.5 m/s^2 Note: accelerometer units are expressed in distance/time\highlight{^2}, which in this case is m/s\bold{^2}. Calculating the total distance traveled is one of the most common exam questions you can see. Example: The speed time schedule shows a 50-second journey by car, Calculate the total distance travelled in 50 seconds. we know the area according to schedule = Distance travelled To find out the area according to this graph, we will break it down into 4 forms: A, B, C and D. It gives two triangles, rectangle and trapezoidal, which are all shapes that we can work from the area. \text{A}=\dfrac{1}{2}\times10 \times15= 75 m \text{B}=10\times15=150 m C=\dfrac{1}{2}(15+25)\times10=200 m D=\dfrac{1}{2}\times20\times25=250 m Total distance travelled: 75+150+200+250=675 m Find an average gradient, there is a slope over time. Example: Displays the speed time schedule of the person running the race for the first 4 seconds. Calculate the average acceleration in 4 seconds. We know: Line Gradient = Acceleration to From average acceleration in 4 seconds, we draw a line from where the graph is 0 s, where the graph is 4 s and find its gradient. So, we get the average acceleration, \text{gradient}=\dfrac{6-0}{4-0}=1.5 m/s^2 Instant transition finding is at some point a tangential gradient. Example: Displays the speed time schedule of the person running the race for the first 4 seconds. Calculate instant acceleration in 2 seconds. To do this, after 2 seconds we will draw a tangent of the line and we will leave the gradient of that gradient. This is shown above. Then we get instant acceleration, \text{gradient}=\dfrac{5.8-3.2}{3.5-1.0} = 1.04 m/s^2 (3 sf). So, first we draw directly from origin to (12, 4), because after 12 seconds it reaches 4 m/s. Then, the next part told us the deceleration is 0.1 m / s ^ 2 20 seconds. So if the speed decreases by 0.1 every second, after 20 seconds it will be 0.1 \times 20=2 m/s Therefore, the speed is 2 m/s in 32 seconds, so we will draw a straight line from (12, 4) to (32, 2). Finally, the constant speed will be reprised by a flat line running up to 50 second point, still at a speed of 2 m/s. The result should look like the diagram below. We need to find the area under the schedule. To do this, we will divide it into forms, we know how to calculate the area, as seen below. A is a triangle, B and C are trapezoidal, and D is a rectangle. So we get \text{A}=\dfrac{1}{2}\times10\times15=75 m \text{B}=\dfrac{1}{2}\times(10+15)\times5=162.5 m text \{C}=\dfrac{1}{2}\times(10+20)\times5=75 m \text{D}=30\times20 = 600 m Therefore, the total distance travelled by the cyclist is 75+62,5+75+600=812,5 m To determine the average acceleration, we draw a line from the origin of the chart to the end, as shown below. The average acceleration is the gradient of this line. So the average acceleration is \text{gradient}=\dfrac{4-0}{50-0}= 0.08 m/s^2 SelectionFile type iconFile nameDescriptionSizeRevisionTimeUser Ċ Distance-TimeGraphs.pdfView Download Distance-Time Graphs Worksheet 839k v. 1 September 9, 2013, 2:51 Pm an unknown user ċ interpreting charts worksheet (pink).pdfView Download interpretation graphs (pink) 45k v. 1 September 25, 2013, 8:58 Unknown user Ċ 3.2 section pgs 60-66.pdfView Download CPO Science Book Section 3.2/pgs 60-66 1346k v. 1 September 9, 2013, 2:50 PM Unknown user Ċ section 3.3 pgs 67-73.pdfView Download CPO Science Book Section 3.3/pgs 67-73 1360k v. 1 September 9, 2013, 2:51 Pm Unknown User Ċ Speed_and_Acceleration-CSI_worksheet1.pdfView Download Bullets Flyin Worksheet 80k v. December 1 December 7, 2011, 6:12 Unknown User Ċ Speed and Speed Review Worksheet - Student Copy.pdfView Download Speed and Speed Review (Blue Worksheet) 303k v. 1 September 233 1:46 PM 2012 1:46 PM Ċ Speed Lab Write up Rubric.pdfView Speed Lab Rubric 391k v. 1 Sep 15, 2013, 5:39 Pm Unknown User Ċ Speed Problems.pdfView Download Speed Problems (pink worksheet) 234k v. 1 Sep 10, 2013, 2:37 Unknown user Ċ Speed-TimeGraphs.pdfView Download Speed-Time Graph Worksheet 800k v. 1 Nov 18, 2011, 2:49 Pm unknown user Ċ Velocity3.2Worksheet.pdfView Download speed 3.2 Worksheet 1117k v. 1 Nov 18, 2011, 2:48 UNKNOWN user In this worksheet , we practice interpreting distance and time schedules and speed and time schedules that reflect the movement of objects. Q11: The red and blue lines indicate that the distance was moving with time for two objects. Which color line corresponds to an object that moves a greater distance? ARed BBlue CSsothesith moves at the same distance. Which color line corresponds to an object that moves at a higher average speed? ABlue BRed CS objects move at the same average speed. Which color line corresponds to an object with a higher maximum speed? ARed BBlue CBoth objects have the same maximum speed. Speed.

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