Interpreting Graphs

A few students are lacking in confidence in their ability to interpret graphs so here are a few questions from the SG Credit Papers for you to practice. You can always do the past paper questions, but here are a few questions to do. I will upload the answers as soon as I’ve done them! Papers found at the link here <https://www.mrsphysics.co.uk/usefullinks/category/sgpp/>

| **Paper** | **Year** | **Question** | **Look at the graph and answer the work below.** |
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| SG Credit | 2000 | Q3 | * Describe, in detail what happens to the resistance of the filament lamp as the lamp is left on?
* Suggest why the resistance remains constant after 0.5s
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| SG Credit | 2000 | Q6c | * Describe, in detail what happens to the output voltage of the thermocouple as its temperature increases?
* What voltage is produced by the thermocouple at 37°C
* How could the thermocouple and this graph be used to tell if someone was ill?
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| SG Credit | 2000 | Q9c(try the whole question) | * Explain in detail the motion of both the police car and the sports car.
* Calculate the acceleration of the police car when it moves off.
* Determine the distance travelled by both the police car and the sports car at 50s.
* Which car will be in front?
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| SG Credit | 2000 | Q12b | * Explain what happens to the gravitational field strength the higher you go from the surface of the Earth.
* Over the height of 2800 km does the gravitational field strength halve?
* What is the gravitational field strength on the surface of the Earth according to the graph?
* The ISS orbits approximately 360 km above the surface of Earth. Determine the gravitational field strength at this height.
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| SG Credit | 2001 | Q7a | * From the graph of Resistance against temperature what can you conclude about how the resistance changes with temperature?
* Determine the temperature at which the thermistor has a resistance of 2.0 kΩ
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| SG Credit | 2001 | Q10 | * Is the acceleration greater in the first 10 s or from 10-40 s? Explain how you know this
* Determine the distance the aircraft move in the first 10 s?
* Determine the distance travelled by the aircraft after 40 s
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| SG Credit | 2002 | Q3a | * Determine the resistance of the component under test.
* State the voltage across the component when the current is 1.2 A through it.
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| SG Credit | 2002 | Q3b | * Does the resistance of the component in part b remain constant? Explain how you know this.
* State the voltage across the component when the current is 1.2 A through it.
* State the current through the component when the voltage across it is 12 V
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| SG Credit | 2002 | Q10 | * Describe the motion of the hare over the 25 s.
* Describe the motion of the greyhound over the first 25 s
* Calculate the acceleration of the greyhound
* Calculate the distance travelled by the hare in the first 20s
* Calculate the distance travelled by the greyhound in the first 20s
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| SG Credit | 2003 | Q17 | * State the time when the activity of the source is 1600 MBq
* Determine the time taken for the activity of the source to drop to 400 MBq
* Determine the half-life of the source from the graph.
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| SG Credit | 2003 | Q10 | * Describe the motion of the cyclist from the graph.
* Calculate the accelerations for each part of the journey
* Determine the distance travelled by the cyclist over the 20 s.
* State the time(s) when the cyclist was travelling at 6 ms-1
* State the speed of the cyclist 2 s onto the journey.
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| SG Credit | 2003 | Q11 | * Describe how the force of friction on the model boat changes over the 10 s.
* State the force of friction acting on the boat 2s after the motor was switched on.
* Describe and explain the motion of the boat after 7s.
* Looking just at the graph, explain how you could determine the force provided by the motor.
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| SG Credit | 2004 | Q9 | * Describe the motion of the vehicle for the 150 s described in the graph.
* Determine the distance travelled by the vehicle in 150 s
* Calculate the acceleration of the vehicle over the 150 s
* If the mass of the vehicle is 3000 kg, calculate the unbalanced force on the vehicle.
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| SG Credit | 2004 | Q11 | * Explain what is shown in the graph from time 0 to 350 s
* Explain what occurs between P and Q
* Determine the time between P and Q
* If the mass of the substance is 500 g and the heater has a power rating of 30 W, determine the specific latent heat of fusion of the substance.
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| SG Credit | 2005 | Q4 | * State what happens to the current in the vacuum cleaner during the first 4.5 s after switch on.
* State the current when the motor has reached full speed.
* Estimate the current through the motor 1s after switch on.
* Why is this graph not suitable for full marks in an assignment (check the marking instructions)
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| SG Credit | 2005 | Q8 | * State how the current changes as the voltage across the resistor changes.
* State the voltage at which the transistor starts to conduct.
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| SG Credit | 2005 | Q11 | * Calculate the acceleration of the train during the first 200s
* Calculate the length of the journey
* If possible draw out the graph for part c and answer part c of this question.
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| SG Credit | 2006 | Q3b | * Plot a graph of the results of voltage against current.
* Explain which result should be retaken.
* Determine the resistance from the graph.
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| SG Credit | 2006 | Q5 | * Determine the half-life of the radioactive source from the graph.
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| SG Credit | 2006 | Q9a | * State the driver’s reaction time.
* Calculate the braking distance.
* Calculate the thinking distance
* Calculate the overall stopping distance.
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| SG Credit | 2006 | Q11 | * The wind blows at a speed of 10 ms-1, state the charging current at this wind speed.
* State the wind speed required to produce a charging current of 13 A.
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| SG Credit | 2007 | Q7aii | * Why is the received sound at a lower sound level?
* Does the length of the pulse change between the transmitted and received sound?
* Determine the reduction in sound level between the transmitted and received pulse?
* Determine the time between the transmitted pulse being detected and the received sound being detected.
* If the sound travels at 1500 ms-1 in the ear. Calculate the distance between the device and the inner ear.
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