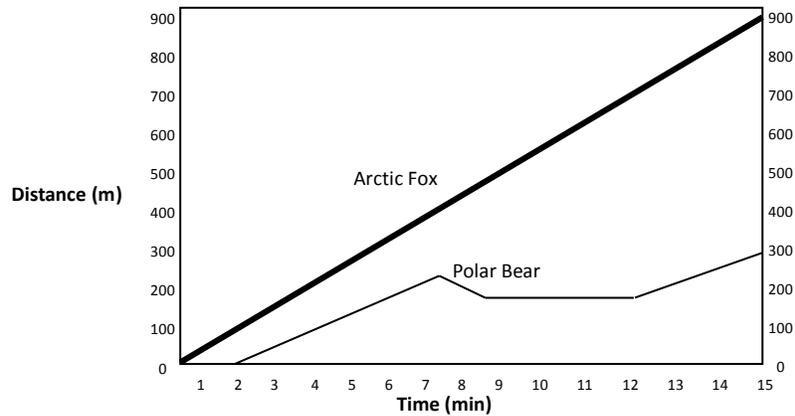


# Review for The Motion n Graphing TEST **ANSWERS**

1. A point or object that is used to determine if something is moving is called a: Reference Point or a Frame of Reference. It is almost always assumed to be what: (Moving or Fixed)? **Fixed**
2. Give two examples of possible **reference points** for a ship sailing in the ocean. **Land, trees, other ships, rocks, the stars, moon, sun, an island, and some possible others.**
3. What is the **formula for speed (or velocity)**? **Speed= Distance/Time**
4. What is the **formula for time**? **Time= Distance/Speed**
5. What is the **formula for distance**? **Distance= Speed x Time**
6. If you travel a distance of 10 km in 5 hours what is your **speed**? **10km/5h = 2 km/h**
7. If you are going 2 km/h and need to go 10 km to get to the beach how long will it take? **10km/2km/h = 5 hours**
8. You travel at 100 km/h for 6 hours. How far have you traveled? **100km/h x 6h = 600 km**
9. What is the main **difference** between **speed** and **velocity**? **Direction (information with velocity)**
10. What is the **definition of acceleration** (3 words or less)? **Acceleration** is: **change in velocity.**
11. Name **three things** or ways you can **accelerate**? **Speed up, slow down, turn, friction, outside force**
12. What is the **formula** for **acceleration**? **Acceleration= Velocity/Time** or **Acc = Speed/Time**
13. What are the units for acceleration? **m/s<sup>2</sup> or m/s/s**
14. A police car goes from 20 m/s to 60 m/s in 8 seconds. What is the acceleration of the car?  
$$\frac{60\text{m/s} - 20\text{m/s}}{8\text{ sec} - 0\text{ sec}} = 5\text{ m/s}^2$$
15. What is the **formula for SLOPE**? **Rise/Run** or **y-axis/x-axis**
16. The **SLOPE** of **DISTANCE vs. TIME Graph** is what? **SPEED**
17. The **SLOPE** of **SPEED (VELOCITY) vs. TIME GRAPH** is what? **ACCELERATION**
18. What is the **average speed** for a car that goes 100km/h for 2 hours and then 200 km/h for 1 hour? **133 km/h**  
**This is a two-step problem. First, you need to figure out the distance that was traveled for the two different speeds (100km/h x 2hrs = 200 km and 200km/h x 1 hr = 200 km). This is a total distance of 400 km traveled in 3 hours. So 400km/3hr = 133 km/h average speed over three hours. Now, you might have wanted to put 150 km/h. It seems right, but if you look at questions you will notice that you spent a majority of the time (2 hours) going 100km/h and only 1 hour going 200km/h. This means the car spent longer traveling at the slower speed and less time at the faster speed (that is why the average is closer to 100km/h compared to 200km/h). Now, if the car spent one hour at each of the two speeds then the average would have been 150 km/h.**

Use the graph below for questions 17-26.



19. What does the slope of either line tell you? **average speed**
20. What is the **Arctic Fox's speed**? **60 m/min**
21. Is the speed of the **Arctic Fox** constant or changing? How do you know? **Constant (Straight line)**
22. Is the speed of the **Polar Bear** constant or changing? How do you know? **Changing because the slopes of line segments are different.**
23. Does the **Polar Bear's** speed change at all? How do you know? **Yes, slope changes (4 different lines (slopes))**
24. Between 10 and 12 minutes is Polar Bear moving? How do you know? **No, horizontal line shows distance did not increase over the time period. The polar bear did not change the distance it moved for that period in time.**
25. Who traveled furthest in 10 minutes? **Arctic Fox**
26. What was the total displacement of the Polar Bear? **300 meters**
27. What was the total distance traveled by the Polar Bear at the end of 15 minutes? **330 m (you get that from adding the 30 m the polar bear walked back towards the started around the 7 to 8-minute mark)**
28. What is the Fox's average speed for the entire 15 minutes? **60 m/min**
29. What is the Polar Bear's average speed for the entire 15 minutes? **20 m/min**
30. Did the polar bear have a greater average speed  **$\frac{250m - 0m}{7 \text{ min} - 2 \text{ min}} = 50m/min$**   **$\frac{300m - 190m}{15 \text{ min} - 9 \text{ min}} = 18m/min$**