

1. A pencil falls off of a desk. What moves the pencil toward the floor?
2. What causes a ball to move through the air when it is thrown?
3. What keeps the moon orbiting Earth?
4. Peter helped his family move last week. He noticed when he tried to slide a heavy box across the floor, it was difficult. Which force causes this to happen?

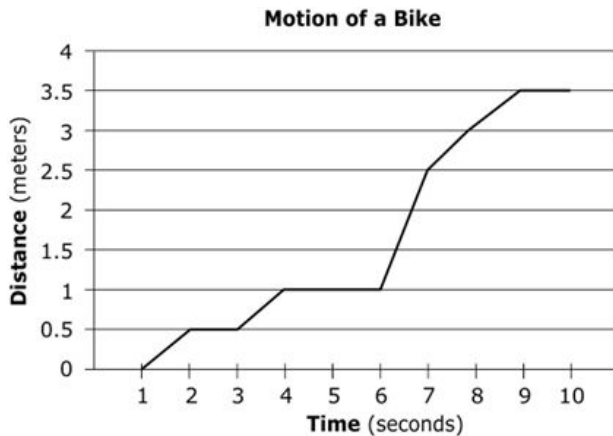
5. Why are new tires on a car better than old, worn tires?

6. Give an example of a time when you would want to increase friction.

7. Once a space shuttle returns to Earth's atmosphere, which force helps the shuttle return to Earth's surface?

8. The graph shows the motion of a student riding a bike.

For which period of Time was the student stopped?



9. A train travels at a constant speed of 60 miles per hour. How many miles will the train travel in 4 hours?
(distance = speed × time)

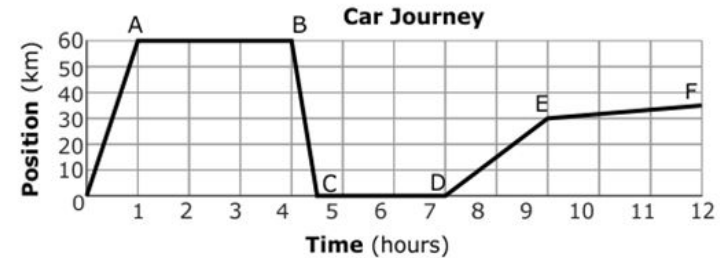
10. Write a story for a graph that has a line that turns upward.

11. How long will it take a car that is moving at 60 miles per hour to travel 120 miles? (speed = distance ÷ time)

12. How can the speed of an object **best** be determined?

13. Ana biked 20 kilometers between 2:00 p.m. and 3:00 p.m., then rested and biked an additional 30 kilometers between 3:30 p.m. and 5:00 p.m. Describe Ana's trip?

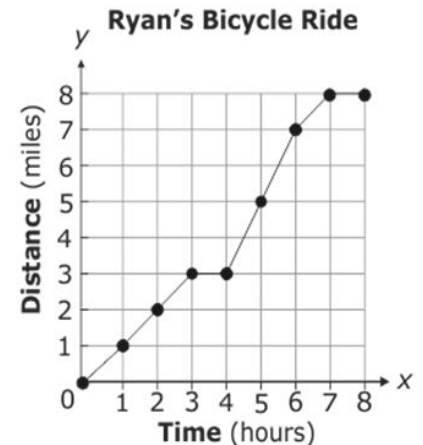
14. The graph below shows the journey of a car over a period of 12 hours.



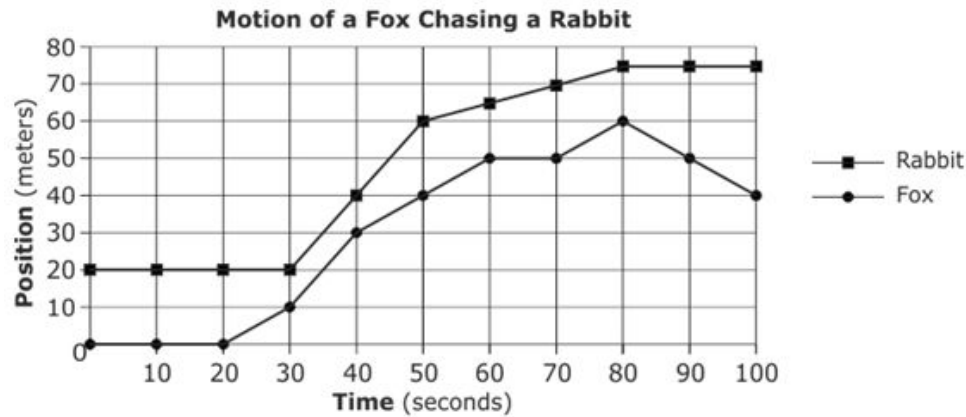
Which line segment shows a period of time when the car was heading back to its starting place?

15. Ryan spends the day riding his bicycle around the city. The graph records his motion during the day.

Write a statement about Ryan's speed between 0 and 3 hours.

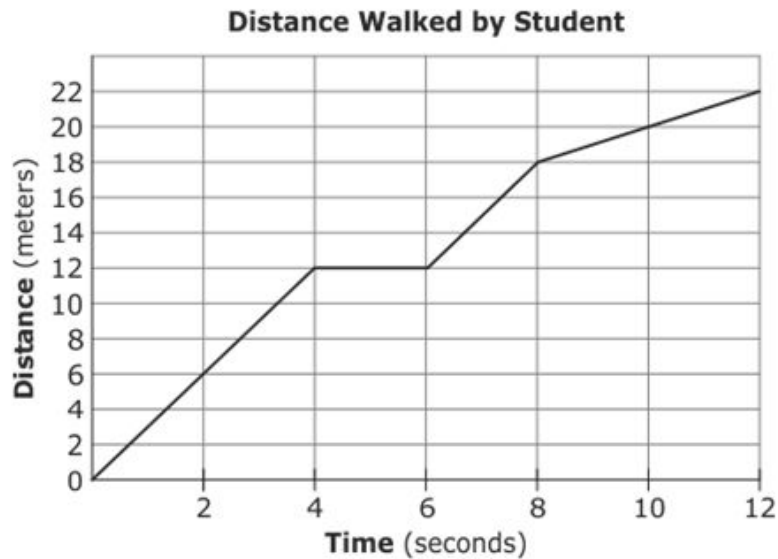


16. Below is a graph showing the change in position over time for a fox and the rabbit it is chasing.



Based on the graph, in the beginning of the chase, which animal was at rest the longest?

17. The graph below shows the motion of a student over time.

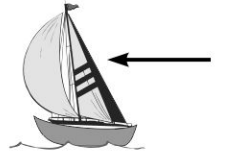


After walking, the student stopped. For how long did the student stop before he continued on his way?

18. Joe rolls a ball to Cindy, and Cindy keeps it. Draw a graph that shows the motion of the ball as it rolls between them.

19. Two teams are playing "tug-of-war" with a long rope. Both teams have six members each that are all about the same size and strength. During the game, two members of the same team let go of the rope at the same time and quit playing. What will **most likely** occur next?

20. Wind is acting on the sails of a boat as shown in the illustration. The force of the wind is greater than the force of the water. Which will **most likely** happen to the boat if the wind increases?



21. A student is pushing a box of books across the floor. The student stops, removes some of the books, and then continues pushing the box across the floor. Explain how removing some of the books affected the motion of the object.

22. A student is investigating the effect of force on several objects.



If each ball is rolled with the same amount of force on the same surface, which ball will roll the farthest?

23. An object is traveling at a steady speed in a straight line. What will cause the object to change directions?

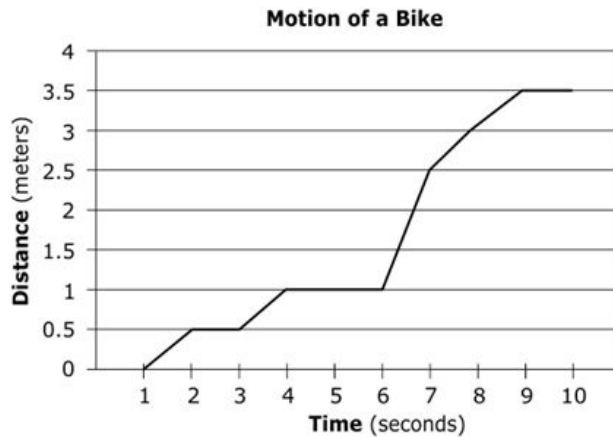
24. What must be true for a baseball to be hit high into the air?

25. Describe the speed of a ball as it is thrown straight up into the air and comes back down?

1. A pencil falls off of a desk. What moves the pencil toward the floor? **Gravity**
2. What causes a ball to move through the air when it is thrown?
Force
3. What keeps the moon orbiting Earth? **Earth's gravity**
4. Peter helped his family move last week. He noticed when he tried to slide a heavy box across the floor, it was difficult. Which force causes this to happen? **Friction**
5. Why are new tires on a car better than old, worn tires?
New tires provide more friction on the road than old tires.
6. Give an example of a time when you would want to increase friction. Possible: **Rubber on shoes helps keep you from slipping on smooth ground.**

7. Once a space shuttle returns to Earth's atmosphere, which force helps the shuttle return to Earth's surface?
Gravitational forces

8. The graph shows the motion of a student riding a bike.



For which period of Time was the student stopped?
4-5 seconds and 9-10 seconds

9. A train travels at a constant speed of 60 miles per hour. How many miles will the train travel in 4 hours?
(distance = speed × time) **60 × 4 = 240 miles**

16. Below is a graph showing the change in position over time for a

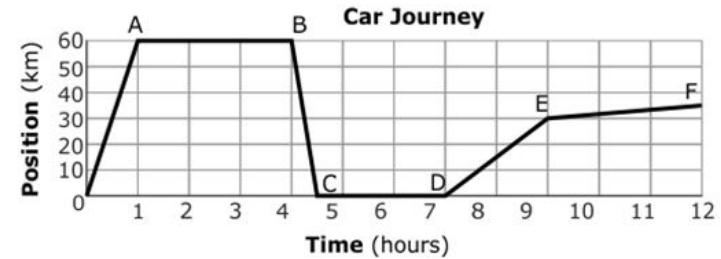
10. Write a story for a graph that has a line that turns upward.
Mrs. Kramer stopped at a red light, then floored it!

11. How long will it take a car that is moving at 60 miles per hour to travel 120 miles? (speed = distance ÷ time) **120 ÷ 60 = 2 hours**

12. How can the speed of an object **best** be determined?
Distance divided by time traveled.

13. Ana biked 20 kilometers between 2:00 p.m. and 3:00 p.m., then rested and biked an additional 30 kilometers between 3:30 p.m. and 5:00 p.m. Describe Ana's trip? **Ana biked the same average speed during both parts of her bike ride.**

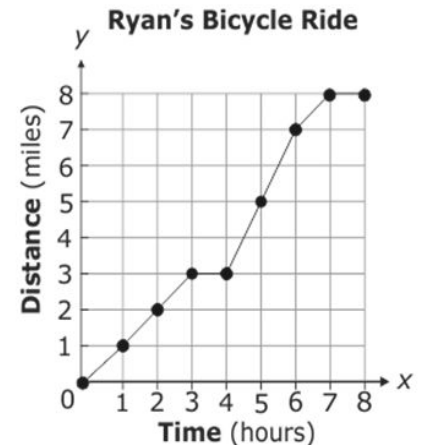
14. The graph below shows the journey of a car over a period of 12 hours.



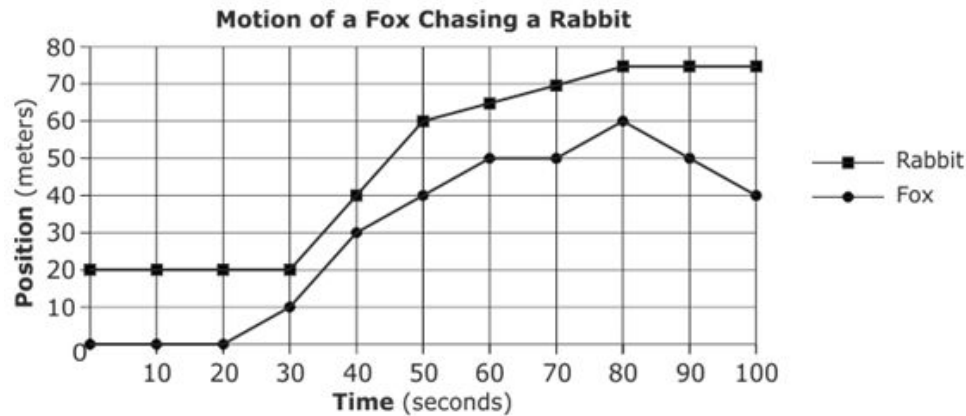
Which line segment shows a period of time when the car was heading back to its starting place? **Line segment BC**

15. Ryan spends the day riding his bicycle around the city. The graph records his motion during the day.

Write a statement about Ryan's speed between 0 and 3 hours. **He was traveling at a constant speed.**

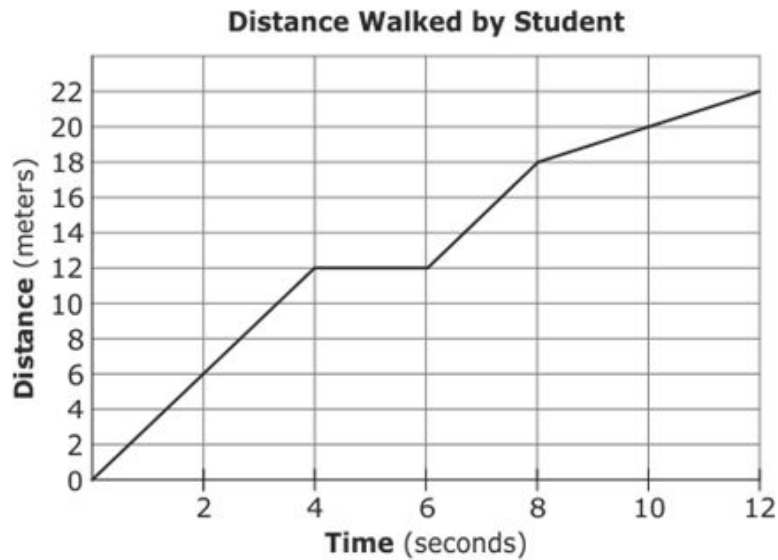


fox and the rabbit it is chasing.



Based on the graph, in the beginning of the chase, which animal was at rest the longest? **The rabbit**

17. The graph below shows the motion of a student over time.

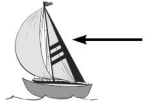


After walking, the student stopped. For how long did the student stop before he continued on his way? **2 seconds**

18. Joe rolls a ball to Cindy, and Cindy keeps it. Draw a graph that shows the motion of the ball as it rolls between them.

Diagonal starting at 0 and going up

19. Two teams are playing “tug-of-war” with a long rope. Both teams have six members each that are all about the same size and strength. During the game, two members of the same team let go of the rope at the same time and quit playing. What will **most likely** occur next? **The rope will move in the direction of the team with more members.**



20. Wind is acting on the sails of a boat as shown in the illustration. The force of the wind is greater than the force of the water. Which will **most likely** happen to the boat if the wind increases? **The boat will speed up.**

21. A student is pushing a box of books across the floor. The student stops, removes some of the books, and then continues pushing the box across the floor. Explain how removing some of the books affected the motion of the object. **Removing some of the books reduced the mass of the box, and less force was needed to push it across the floor.**

22. A student is investigating the effect of force on several objects.



If each ball is rolled with the same amount of force on the same surface, which ball will roll the farthest? **Golf ball**

23. An object is traveling at a steady speed in a straight line. What will cause the object to change directions?
An unbalanced force acting on the object.

24. What must be true for a baseball to be hit high into the air? **The force striking the ball must be greater than the force of gravity**

25. Describe the speed of a ball as it is thrown straight up into the air and comes back down? **The ball goes slower and slower as it goes up, and then goes faster and faster as it comes down.**