

Lesson 3-6: Equations and Problem Solving

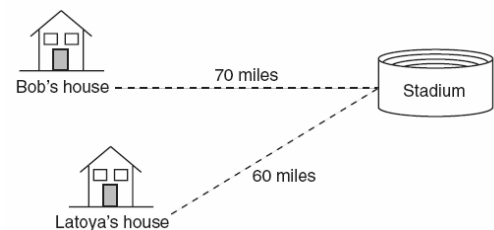
Part 1: Defining Variables

1. 080024a, P.I. A.A.6
The sum of the ages of the three Romano brothers is 63. If their ages can be represented as consecutive integers, what is the age of the middle brother?

Part 2: Distance-Rate-Time Problems

2. 060101a, P.I. A.A.1
A car travels 110 miles in 2 hours. At the same rate of speed, how far will the car travel in h hours?
[A] $55h$ [B] $\frac{h}{55}$ [C] $220h$ [D] $\frac{h}{220}$
3. 010027a, P.I. A.A.6
A truck traveling at a constant rate of 45 miles per hour leaves Albany. One hour later a car traveling at a constant rate of 60 miles per hour also leaves Albany traveling in the same direction on the same highway. How long will it take for the car to catch up to the truck, if both vehicles continue in the same direction on the highway?
4. 080518a, P.I. A.A.6
A bicyclist leaves Bay Shore traveling at an average speed of 12 miles per hour. Three hours later, a car leaves Bay Shore, on the same route, traveling at an average speed of 30 miles per hour. How many hours after the car leaves Bay Shore will the car catch up to the cyclist?
[A] 5 [B] 4 [C] 8 [D] 2

5. 060010a, P.I. A.A.6
A truck travels 40 miles from point A to point B in exactly 1 hour. When the truck is halfway between point A and point B , a car starts from point A and travels at 50 miles per hour. How many miles has the car traveled when the truck reaches point B ?
[A] 50 [B] 40 [C] 60 [D] 25
6. 010125a, P.I. A.A.6
Two trains leave the same station at the same time and travel in opposite directions. One train travels at 80 kilometers per hour and the other at 100 kilometers per hour. In how many hours will they be 900 kilometers apart?
7. 010433a, P.I. A.A.6
Bob and Latoya both drove to a baseball game at a college stadium. Bob lives 70 miles from the stadium and Latoya lives 60 miles from it, as shown in the accompanying diagram. Bob drove at a rate of 50 miles per hour, and Latoya drove at a rate of 40 miles per hour. If they both left home at the same time, who got to the stadium first?



8. 080019a, P.I. A.A.6
A girl can ski down a hill five times as fast as she can climb up the same hill. If she can climb up the hill and ski down in a total of 9 minutes, how many minutes does it take her to climb up the hill?
[A] 7.5 [B] 1.8 [C] 7.2 [D] 4.5

[2] 21 and the student shows an appropriate solution, such as the equation $x + x + 1 + x + 2 = 63$ or trial and error.

[1] Appropriate work is shown, but an incorrect answer is found.

or [1] An incorrect equation is shown, but it is solved appropriately to find an answer, such as $x + x + 2 + x + 4 = 63$.

or [1] 21 but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[1] incorrect procedure.

[2] A

[3] 3 hours and an appropriate method or equation is shown, such as $45(x + 1) = 60x$.

[2] An appropriate method is shown, but an incorrect answer is found, such as 4 hours (the truck's time) or 180 miles traveled.

[1] An appropriate equation or method is shown, but no answer is found, such as showing an equation that reflects a one-hour difference in time but it is not solved.

or [1] 3 hours and no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[3] incorrect procedure.

[4] D

[5] D

[2] 5, and appropriate work is shown, such as solving the linear equation $80x + 100x = 900$, using a diagram or proportion or trial and error.

[1] Appropriate work is shown, but one computational error is made.

or [1] 5, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[6] incorrect procedure.

[2] Bob, and appropriate work is shown, such as using the distance formula to calculate the two travel times or setting up a proportion.

[1] Appropriate work is shown, but one computational or conceptual error is made, but an appropriate answer is found.

or [1] Appropriate work is shown, but no answer or an incorrect answer is found.

[0] Bob, but no work or inappropriate work is shown.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[7] obviously incorrect procedure.

[8] A
