

NAME: _____

A.M.1: Calculate rates using appropriate units (e.g., rate of a space ship versus the rate of a snail).

1. 080805a, P.I. A.M.1

Andy drives 80 miles to get to the Thruway, drives 100 miles on the Thruway, and then drives an additional 75 miles after leaving the Thruway. If the entire trip took 5 hours and he made no stops, what was his average speed, in miles per hour?

[A] 65 [B] 255 [C] 250 [D] 51

2. 080111b, P.I. A.M.1

On a trip, a student drove 40 miles per hour for 2 hours and then drove 30 miles per hour for 3 hours. What is the student's average rate of speed, in miles per hour, for the whole trip?

[A] 35 [B] 34 [C] 37 [D] 36

3. 080119b, P.I. A.M.1

If Jamar can run $\frac{3}{5}$ of a mile in 2 minutes 30 seconds, what is his rate in miles per minute?

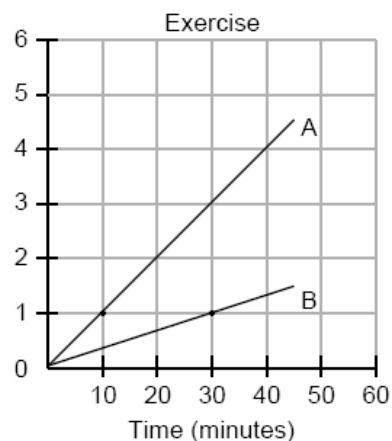
[A] $4\frac{1}{6}$ [B] $\frac{4}{5}$ [C] $\frac{6}{25}$ [D] $3\frac{1}{10}$

4. 080736a, P.I. A.M.1

The trip from Manhattan to Montauk Point is 120 miles by train or by car. A train makes the trip in 2 hours, while a car makes the trip in $2\frac{1}{2}$ hours. How much faster, in miles per hour, is the average speed of the train than the average speed of the car?

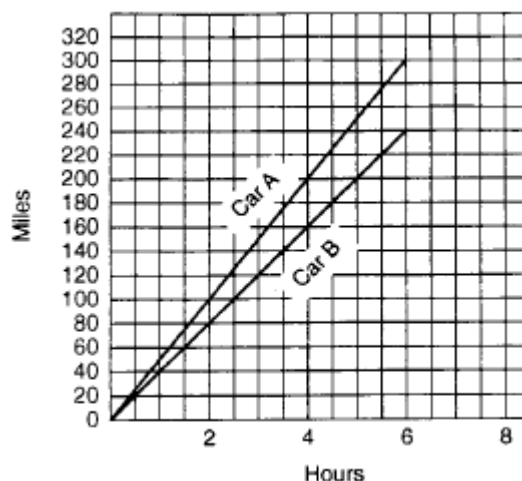
5. 069926a, P.I. A.M.1

During a 45-minute lunch period, Albert (A) went running and Bill (B) walked for exercise. Their times and distances are shown in the accompanying graph. How much faster was Albert running than Bill was walking, in miles per hour?



6. spring9827a, P.I. A.M.1

The figure below represents the distances traveled by car A and car B in 6 hours.



Which car is going faster and by how much?

NAME: _____

7. 060116b, P.I. A.M.1

On her first trip, Sari biked 24 miles in T hours. The following week Sari biked 32 miles in T hours. Determine the ratio of her average speed on her second trip to her average speed on her first trip.

[A] $\frac{3}{4}$ [B] $\frac{3}{2}$ [C] $\frac{4}{3}$ [D] $\frac{2}{3}$

8. 080415a, P.I. A.M.1

A rocket car on the Bonneville Salt Flats is traveling at a rate of 640 miles per hour. How much time would it take for the car to travel 384 miles at this rate?

[A] 245 minutes [B] 1.7 hours
[C] 36 minutes [D] 256 minutes

9. 080632a, P.I. A.M.1

Running at a constant speed, Andrea covers 15 miles in $2\frac{1}{2}$ hours. At this speed, how many *minutes* will it take her to run 2 miles?

10. 060029a, P.I. A.M.1

The distance from Earth to the imaginary planet Med is 1.7×10^7 miles. If a spaceship is capable of traveling 1,420 miles per hour, how many days will it take the spaceship to reach the planet Med? Round your answer to the *nearest day*.

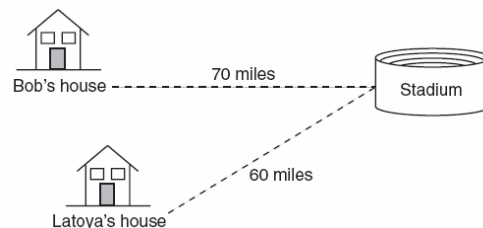
11. 060308b, P.I. A.M.1

Two objects are 2.4×10^{20} centimeters apart. A message from one object travels to the other at a rate of 1.2×10^5 centimeters per second. How many seconds does it take the message to travel from one object to the other?

[A] 1.2×10^{15} [B] 2.88×10^{25}
[C] 2.0×10^{15} [D] 2.0×10^4

12. 010433a, P.I. A.M.1

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?



13. 080019a, P.I. A.M.1

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] 1.8 [B] 7.5 [C] 4.5 [D] 7.2

NAME: _____

14. 010027a, P.I. A.M.1

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?

15. 080518a, P.I. A.M.1

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] 8 [B] 2 [C] 4 [D] 5

16. 010125a, P.I. A.M.1

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?

17. 060101a, P.I. A.M.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] $\frac{h}{55}$ [B] $220h$ [C] $55h$ [D] $\frac{h}{220}$

18. 060833a, P.I. A.M.1

Kimberly rides her bicycle from her home to school at an average rate of 12 miles per hour. If it takes her 20 minutes to get to school, how many miles is her home from her school?

19. 060010a, P.I. A.M.1

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] 25 [B] 40 [C] 50 [D] 60

A.M.1: Calculate rates using appropriate units (e.g., rate of a space ship versus the rate of a snail).

[1] D

[2] B

[3] C

[3] 12, and appropriate work is shown, such as finding the rates of both vehicles and then subtracting 48 from 60.

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

or [2] The rates of both vehicles are found correctly, and appropriate work is shown, but they are not subtracted.

or [2] The rates of both vehicles are found correctly, and the correct difference is found, but no work is shown.

[1] Appropriate work is shown, but two or more computational errors are made.

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

or [1] The rates of both vehicles are found correctly, but no work is shown, and the difference is not found.

or [1] 12, 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

[4] incorrect procedure.

[3] 4 and an appropriate method is shown, such as calculating A at 6 mph and B at 2 mph through arithmetic, formula, or extending the graph to 60 minutes.

[2] The speeds of 6 and 2 are found but not their difference.

or [2] Their difference is found but not in miles per hour.

[1] Only distances of 4.5 miles and 1.5 miles are found.

or [1] The speeds found are incorrect but then are subtracted appropriately.

or [1] 3 times as fast and no appropriate explanation is given.

or [1] 4 and no appropriate explanation is given.

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

[5] incorrect procedure.

[3] Answer of car A, by 10 mph, and an explanation such as showing A at 50 mph and B at 40 mph or that the difference at the one hour mark on the graph is 10 miles or saying that the car A graph has a steeper slope.

[2] Answer as above without the unit of mph.

or [2] Answer of 10 mph by showing 50 - 40 but without identifying car A as the faster one.

or [2] Answers of car A and 10 mph without an appropriate explanation.

or [2] Answer of car A because its graph has a steeper slope.

or [2] Car A is faster because it travels farther than car B in the same amount of time.

[1] Answer of A with no or incorrect difference in speed (i.e., 60 miles) and no appropriate explanation.

or [1] Answer of 10 with no appropriate

[6] explanation or car identified.

[7] C

[8] C

- [2] 20, and appropriate work is shown, such as $\frac{15}{150} = \frac{2}{x}$.
- [1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made, such as expressing the answer as $\frac{1}{3}$ hour.
or [1] 20, 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 incorrect procedure.
-
- [3] 499 days and appropriate work is shown, such as $\frac{17,000,000 \text{ miles}}{1420 \frac{\text{miles}}{\text{hour}} \times 24 \frac{\text{hours}}{\text{day}}}$.
- [2] Appropriate work is shown, but one computational error is made or the student incorrectly calculates 1.7×10^7 by one decimal place.
or [2] Appropriate work is shown, but the answer is rounded incorrectly or is not rounded.
[1] $1.7 \times 10^7 = 17,000,000$ is shown.
or [1] $\frac{1.7 \times 10^7}{1420} = 11,971.831$ hours is shown.
or [1] 34,080 miles in 1 day is shown.
or [1] 499 but no work is shown.
[0] The student does not understand scientific notation.
or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
-
- [10] obviously incorrect procedure.
-
- [11] C _____

- [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 obviously incorrect procedure.
-
- [12] obviously incorrect procedure.
-
- [13] B _____
- [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 incorrect procedure.
-
- [14] incorrect procedure.
-
- [15] B _____
- [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 incorrect procedure.
-
- [16] incorrect procedure.
-
- [17] C _____

[2] 4, and appropriate work is shown, such as using the formula $rt = d$ or trial and error with at least three trials and appropriate checks.

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

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

or [1] The trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but no solution is found.

or [1] 4, but no work or fewer than three trials with appropriate checks are shown.

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

[18] incorrect procedure.

[19] A