

Section 4-1: Solving Equations Using More than One Operation

Properties of Equality

1. 080219a, P.I. A.A.6
If $2x + 5 = -25$ and $-3m - 6 = 48$, what is the product of x and m ?
[A] -33 [B] 3 [C] -270 [D] 270
2. 060519a, P.I. A.A.6
If $-2x + 3 = 7$ and $3x + 1 = 5 + y$, the value of y is
[A] 1 [B] 0 [C] 10 [D] -10
3. 060409a, P.I. A.A.6
At the beginning of her mathematics class, Mrs. Reno gives a warm-up problem. She says, "I am thinking of a number such that 6 less than the product of 7 and this number is 85." Which number is she thinking of?
[A] 13 [B] 84 [C] 637 [D] $11\frac{2}{7}$
4. 010801a, P.I. A.A.6
Robin spent \$17 at an amusement park for admission and rides. If she paid \$5 for admission, and rides cost \$3 each, what is the total number of rides that she went on?
[A] 2 [B] 4 [C] 12 [D] 9
5. 010733a, P.I. A.A.6
Every month, Omar buys pizzas to serve at a party for his friends. In May, he bought three more than twice the number of pizzas he bought in April. If Omar bought 15 pizzas in May, how many pizzas did he buy in April?

Section 4-2: Simplifying Each Side of an Equation

Like and Unlike Terms

6. 060214a, P.I. A.A.22
What is the solution of the equation $3y - 5y + 10 = 36$?
[A] 2 [B] 4.5 [C] -13 [D] 13
7. 080015a, P.I. A.A.22
Solve for x : $15x - 3(3x + 4) = 6$
[A] 1 [B] $\frac{1}{3}$ [C] 3 [D] $-\frac{1}{2}$
8. 080602a, P.I. A.A.22
What is the value of p in the equation $2(3p - 4) = 10$?
[A] 1 [B] 3 [C] $2\frac{1}{3}$ [D] $\frac{1}{3}$
9. 060233a, P.I. A.N.5
Mr. Perez owns a sneaker store. He bought 350 pairs of basketball sneakers and 150 pairs of soccer sneakers from the manufacturers for \$62,500. He sold all the sneakers and made a 25% profit. If he sold the soccer sneakers for \$130 per pair, how much did he charge for one pair of basketball sneakers?

Representing Two Numbers with the Same Variable

10. 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?

Section 4-3: Solving Equations That Have the Variable in Both Sides

11. 010705a, P.I. A.A.22
What is the value of n in the equation $3n - 8 = 32 - n$?
[A] 6 [B] -6 [C] -10 [D] 10
12. 010807a, P.I. A.A.22
What is the value of p in the equation $8p + 2 = 4p - 10$?
[A] 1 [B] -3 [C] 3 [D] -1
13. fall0732ia, P.I. A.A.22
Solve for g : $3 + 2g = 5g - 9$
14. 060404a, P.I. A.A.22
If $3(x - 2) = 2x + 6$, the value of x is
[A] 0 [B] 12 [C] 20 [D] 5
15. 010401a, P.I. A.A.22
If $2(x + 3) = x + 10$, then x equals
[A] 5 [B] 4 [C] 14 [D] 7
16. 010601a, P.I. A.A.22
What is the value of x in the equation $5(2x - 7) = 15x - 10$?
[A] -9 [B] -5 [C] 1 [D] 0.6
17. 060702a, P.I. A.A.22
What is the value of x in the equation $6(x - 2) = 36 - 10x$?
[A] 1.5 [B] 6 [C] -6 [D] 3
18. 080731a, P.I. A.A.22
Solve for x : $5(x - 2) = 2(10 + x)$
19. 060602a, P.I. A.A.22
What is the value of x in the equation $13x - 2(x + 4) = 8x + 1$?
[A] 4 [B] 3 [C] 1 [D] 2

Section 4-4: Using Formulas to Solve Problems

20. 060407a, P.I. A.M.2
If the temperature in Buffalo is 23° Fahrenheit, what is the temperature in degrees Celsius? [Use the formula $C = \frac{5}{9}(F - 32)$.]
[A] 45 [B] -45 [C] -5 [D] 5
21. 089908a, P.I. A.M.2
The formula $C = \frac{5}{9}(F - 32)$ can be used to find the Celsius temperature (C) for a given Fahrenheit temperature (F). What Celsius temperature is equal to a Fahrenheit temperature of 77° ?
[A] 8° [B] 171° [C] 45° [D] 25°
22. 060021a, P.I. A.M.2
The formula for changing Celsius (C) temperature to Fahrenheit (F) temperature is $F = \frac{9}{5}C + 32$. Calculate, to the nearest degree, the Fahrenheit temperature when the Celsius temperature is -8 .
23. 010734a, P.I. A.M.2
The formula $C = \frac{5}{9}(F - 32)$ is used to convert Fahrenheit temperature, F , to Celsius temperature, C . What temperature, in degrees Fahrenheit, is equivalent to a temperature of 10° Celsius?
24. 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] 4.5 [B] 1.8 [C] 7.2 [D] 7.5

25. 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?

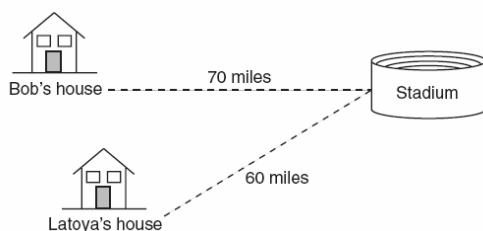
26. 060010a, P.I. A.M.1

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] 60 [C] 40 [D] 50

27. 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?



28. 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?

29. 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?

30. 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] 256 minutes [D] 36 minutes

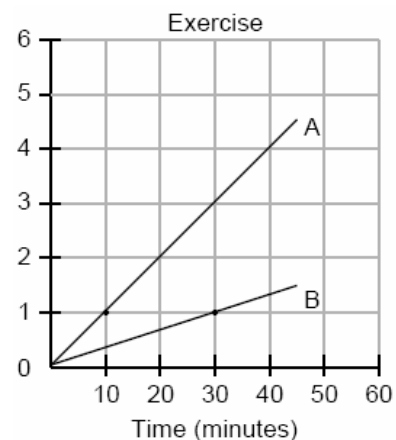
31. 080518a, P.I. A.M.1

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] 5 [D] 4

32. 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?



33. 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?

34. fall0734ia, P.I. A.M.1

Hannah took a trip to visit her cousin. She drove 120 miles to reach her cousin's house and the same distance back home. It took her 1.2 hours to get halfway to her cousin's house. What was her average speed, in miles per hour, for the first 1.2 hours of the trip? Hannah's average speed for the remainder of the trip to her cousin's house was 40 miles per hour. How long, in hours, did it take her to drive the remaining distance? Traveling home along the same route, Hannah drove at an average rate of 55 miles per hour. After 2 hours her car broke down. How many miles was she from home?

35. 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] $\frac{2}{3}$

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

37. 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] $3\frac{1}{10}$ [B] $4\frac{1}{6}$ [C] $\frac{6}{25}$ [D] $\frac{4}{5}$

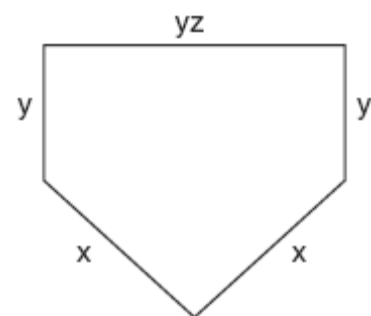
38. 089905a, P.I. A.G.1

The Pentagon building in Washington, D.C., is shaped like a regular pentagon. If the length of one side of the Pentagon is represented by $n + 2$, its perimeter would be represented by

- [A] $n + 10$ [B] $5n + 10$
[C] $10n$ [D] $5n + 2$

39. 010603a, P.I. A.G.1

The lengths of the sides of home plate in a baseball field are represented by the expressions in the accompanying figure.



Which expression represents the perimeter of the figure?

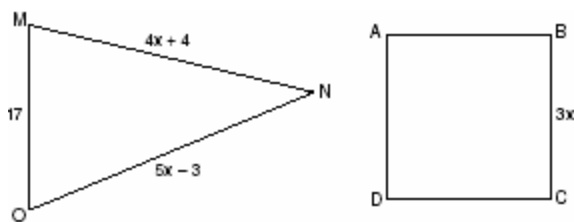
- [A] $2x + 3yz$ [B] $2x + 2y + yz$
[C] $5xyz$ [D] $x^2 + y^3z$

40. 080124a, P.I. A.G.1

An engineer measured the dimensions for a rectangular site by using a wooden pole of unknown length x . The length of the rectangular site is 2 pole measures increased by 3 feet, while the width is 1 pole measure decreased by 4 feet. Write an algebraic representation, in terms of x , for the perimeter of the site.

41. 080537a

In the accompanying diagram, the perimeter of $\triangle MNO$ is equal to the perimeter of square ABCD. If the sides of the triangle are represented by $4x + 4$, $5x - 3$, and 17, and one side of the square is represented by $3x$, find the length of a side of the square.



44. 060719a, P.I. A.A.23

If $c = 2m + d$, then m is equal to

[A] $\frac{c}{2} - d$ [B] $d - 2c$

[C] $\frac{c - d}{2}$ [D] $c - \frac{d}{2}$

45. 060219a, P.I. A.A.23

If $x = 2a - b^2$, then a equals

[A] $\frac{b^2 - x}{2}$ [B] $x + b^2$

[C] $\frac{x - b^2}{2}$ [D] $\frac{x + b^2}{2}$

46. 010421a, P.I. A.A.23

If $2ax - 5x = 2$, then x is equivalent to

[A] $\frac{1}{a - 5}$ [B] $\frac{2 + 5a}{2a}$

[C] $\frac{2}{2a - 5}$ [D] $7 - 2a$

47. 080530a, P.I. A.A.23

If $\frac{x}{4} - \frac{a}{b} = 0$, $b \neq 0$, then x is equal to

[A] $\frac{4a}{b}$ [B] $-\frac{a}{4b}$ [C] $\frac{a}{4b}$ [D] $-\frac{4a}{b}$

48. 080722a, P.I. A.A.23

Which equation is equivalent to $3x + 4y = 15$?

[A] $y = 3x - 15$ [B] $y = 15 - 3x$

[C] $y = \frac{3x - 15}{4}$ [D] $y = \frac{15 - 3x}{4}$

Section 4-5: Solving for a Variable in Terms of Another Variable

42. 080218a, P.I. A.A.23

If $2m + 2p = 16$, p equals

[A] $9m$ [B] $8 - m$

[C] $16 - m$ [D] $16 + 2m$

43. 010116a, P.I. A.A.23

If $bx - 2 = K$, then x equals

[A] $\frac{2 - K}{b}$ [B] $\frac{K - 2}{b}$

[C] $\frac{K + 2}{b}$ [D] $\frac{K}{b} + 2$

Section 4-6: Transforming Formulas

49. 010310a, P.I. A.A.23

The equation $P = 2L + 2W$ is equivalent to

[A] $L = P - W$ [B] $L = \frac{P + 2W}{2}$

[C] $2L = \frac{P}{2W}$ [D] $L = \frac{P - 2W}{2}$

50. 010620a, P.I. A.A.23

In the equation $A = p + prt$, t is equivalent to

[A] $\frac{A - pr}{p}$ [B] $\frac{A}{pr} - p$

[C] $\frac{A - p}{pr}$ [D] $\frac{A}{p} - pr$

51. 060617a, P.I. A.A.23

The formula for the volume of a right circular cylinder is $V = \pi r^2 h$. The value of h can be expressed as

[A] $\frac{V}{\pi r^2}$ [B] $V - \pi r^2$

[C] $\frac{\pi r^2}{V}$ [D] $\frac{V}{\pi} r^2$

52. 010710a, P.I. A.A.23

The formula for potential energy is $P = mgh$, where P is potential energy, m is mass, g is gravity, and h is height. Which expression can be used to represent g ?

[A] $P - mh$ [B] $P - m - h$

[C] $\frac{P}{mh}$ [D] $\frac{P}{m} - h$

53. 069922a, P.I. A.A.23

Shoe sizes and foot length are related by the formula $S = 3F - 24$, where S represents the shoe size and F represents the length of the foot, in inches.

a Solve the formula for F .

b To the nearest tenth of an inch, how long is the foot of a person who wears a size $10\frac{1}{2}$ shoe?

Section 4-8: Finding and Graphing the Solution of an Equality

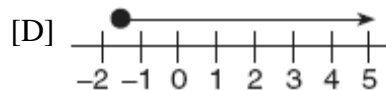
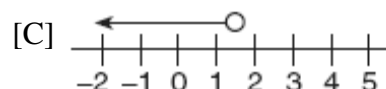
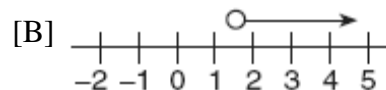
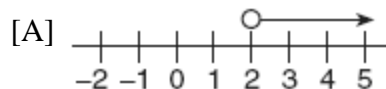
54. fall0704ia, P.I. A.A.29

Which interval notation represents the set of all numbers from 2 through 7, inclusive?

[A] $[2, 7]$ [B] $(2, 7]$ [C] $(2, 7)$ [D] $[2, 7)$

55. 060616a, P.I. 8.G.19

Which graph best represents the solution set for the inequality $x > \sqrt{2}$?



56. 060118a, P.I. A.A.24

In the set of positive integers, what is the solution set of the inequality $2x - 3 < 5$?

[A] $\{0, 1, 2, 3, 4\}$ [B] $\{1, 2, 3\}$

[C] $\{0, 1, 2, 3\}$ [D] $\{1, 2, 3, 4\}$

57. 060311a, P.I. A.A.21

Which number is in the solution set of the inequality $5x + 3 > 38$?

- [A] 7 [B] 6 [C] 5 [D] 8

58. fall0724ia, P.I. A.A.21

Which value of x is in the solution set of the inequality $-2x + 5 > 17$?

- [A] -6 [B] 12 [C] -8 [D] -4

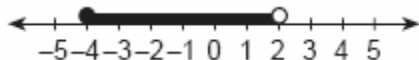
59. 010536a, P.I. A.A.24

Find all negative odd integers that satisfy the following inequality: $-3x + 1 \leq 17$

Graphing the Intersection of Two Sets

60. 060001a, P.I. 8.G.19

Which inequality is represented in the graph below?



- [A] $-4 \leq x \leq 2$ [B] $-4 < x \leq 2$
[C] $-4 < x < 2$ [D] $-4 \leq x < 2$

61. 080411a, P.I. 8.G.19

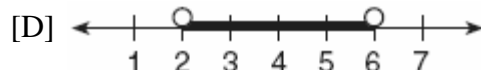
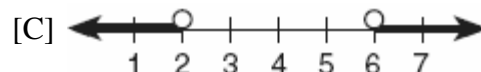
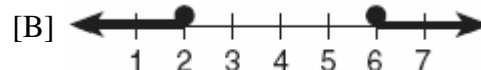
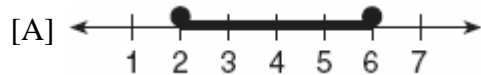
Which inequality is represented in the accompanying graph?



- [A] $-3 \leq x < 4$ [B] $-3 \leq x \leq 4$
[C] $-3 < x \leq 4$ [D] $-3 < x < 4$

62. 010312a, P.I. 8.A.13

Which graph represents the solution set for $2x - 4 \leq 8$ and $x + 5 \geq 7$?



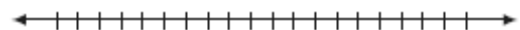
63. 010610a, P.I. 8.G.19

In order to be admitted for a certain ride at an amusement park, a child must be greater than or equal to 36 inches tall and less than 48 inches tall. Which graph represents these conditions?



64. 060532a, P.I. 8.G.19

The manufacturer of Ron's car recommends that the tire pressure be at least 26 pounds per square inch and less than 35 pounds per square inch. On the accompanying number line, graph the inequality that represents the recommended tire pressure.



Section 4-9: Using Inequalities to Solve Problems

65. 080732a, P.I. A.A.6
Thelma and Laura start a lawn-mowing business and buy a lawnmower for \$225. They plan to charge \$15 to mow one lawn. What is the *minimum* number of lawns they need to mow if they wish to earn a profit of *at least* \$750?
66. fall0735ia, P.I. A.A.6
A prom ticket at Smith High School is \$120. Tom is going to save money for the ticket by walking his neighbor's dog for \$15 per week. If Tom already has saved \$22, what is the minimum number of weeks Tom must walk the dog to earn enough to pay for the prom ticket?
67. 010101a, P.I. A.A.6
There are 461 students and 20 teachers taking buses on a trip to a museum. Each bus can seat a maximum of 52. What is the *least* number of buses needed for the trip?
[A] 11 [B] 9 [C] 8 [D] 10
68. 089914a, P.I. A.A.6
In a hockey league, 87 players play on seven different teams. Each team has at least 12 players. What is the largest possible number of players on any one team?
[A] 14 [B] 13 [C] 15 [D] 21
69. 080224a, P.I. A.A.6
A doughnut shop charges \$0.70 for each doughnut and \$0.30 for a carryout box. Shirley has \$5.00 to spend. At most, how many doughnuts can she buy if she also wants them in one carryout box?
70. 069928a, P.I. A.A.6
A swimmer plans to swim at least 100 laps during a 6-day period. During this period, the swimmer will increase the number of laps completed each day by one lap. What is the *least* number of laps the swimmer must complete on the first day?
71. 089910a
On June 17, the temperature in New York City ranged from 90° to 99° , while the temperature in Niagara Falls ranged from 60° to 69° . The difference in the temperatures in these two cities must be between
[A] 20° and 30° [B] 20° and 40°
[C] 25° and 35° [D] 30° and 40°

[1] D

[2] D

[3] A

[4] B

[2] 6, and appropriate work is shown, such as solving the equation $2x + 3 = 15$ 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] A correct equation is written, but no further correct work is shown.

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] 6, but no work or fewer than three trials and 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

[5] incorrect procedure.

[6] C

[7] C

[8] B

[4] \$167.50, and appropriate work is shown, such as $350x + (150)(130) = 1.25(62,500)$ or trial and error with at least three trials with appropriate checks.

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

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

or [2] \$167.50, but only one trial with an appropriate check is shown.

[1] \$167.50, 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

[9] incorrect procedure.

[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

[10] incorrect procedure.

[11] D

[12] B

[2] 4, and appropriate work is shown.

[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] 4, 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

[13] incorrect procedure.

[14] B

[15] B

[16] B

[17] D

[2] 10, and appropriate work is shown, such as solving the equation 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] 10, but no work or fewer than three trials and 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] B

[20] C

[21] D

[2] 18 and correct substitution, $F = \frac{9}{5}(-8) + 32$, is shown.

[1] A correct substitution method is shown, but one computational error is made.

or [1] The answer is not rounded to the nearest integer, such as 17.6 or 17.

or [1] The student substitutes -8 for F , but then solves appropriately for C .

or [1] The student substitutes +8 for C , but then solves appropriately for F .

or [1] 18 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

[22] incorrect procedure.

[2] 50, and appropriate work is shown, such as solving the equation $10 = \frac{5}{9}(F - 32)$.

[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] Correct substitution is made into the equation, but no further correct work is shown.

or [1] 50, 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

[23] incorrect procedure.

[24] D

[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

[25] incorrect procedure.

[26] A

- [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.
-

- [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.
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- [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.
-

[30] D

[31] B

- [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 incorrect procedure.
-

- [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 incorrect procedure.
-

[3] 50, 1.5, and 10, and appropriate work is shown.

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

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

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

or [1] 50, and appropriate work is shown, but no further correct work is shown.

or [1] 1.5, and appropriate work is shown, but no further correct work is shown.

or [1] 10, and appropriate work is shown, but no further correct work is shown.

or [1] 50, 1.5, and 10, but no work is shown.

[0] 50 or 1.5 or 10, but no work is shown.

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

[34] obviously incorrect procedure.

[35] C

[36] B

[37] C

[38] B

[39] B

[2] $6x - 2$ or an equivalent expression, and appropriate work is shown, such as

$$2(2x + 3) + 2(x - 4) = 6x - 2.$$

[1] The length is represented correctly as $2x + 3$ and the width as $x - 4$, but the representation of the perimeter is determined incorrectly.

or [1] The length, the width, and the perimeter are represented appropriately, but by a variable other than x .

or [1] One or both dimensions are represented incorrectly, but the perimeter is represented appropriately.

[0] One or both dimensions are represented incorrectly, and the perimeter is not determined.

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

[40] obviously incorrect procedure.

[3] 18, and appropriate work is shown.

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

or [2] Appropriate work is shown, and the value of x is found, but no further correct 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] A correct expression is written for the perimeter of each figure, but no further correct work is shown.

or [1] 18, 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

[41] incorrect procedure.

[42] B

[43] C

[44] C

[45] D

[46] C

[47] A

[48] D

[49] D

[50] C

[51] A

[52] C

a [1] $\frac{S+24}{3}$ or $\frac{S}{3}+8$

b [1] 11.5

or [1] Correct substitution into an incorrect part a is shown, and the answer is given to the nearest tenth of an inch.

a and b

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

[53] incorrect procedure.

[54] A

[55] B

[56] B

[57] D

[58] C

[3] -5, -3, -1, and appropriate work is shown, such as solving the inequality or trial and error with at least three trials and appropriate checks.

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

or [2] Appropriate work is shown, and the

inequality $x \geq -5\frac{1}{3}$ is written, but no further

correct work is shown.

or [2] The trial-and-error method is used to find the correct solutions, but only two trials and appropriate checks are 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 trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but the solutions are not found.

or [1] -5, -3, -1, but no work or only one trial with an appropriate check is shown.

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

[59] incorrect procedure.

[60] D

[61] C

[62] A

[63] D

[2] A correct graph is drawn on the number line, with a closed circle at the left end and an open circle at the right end.

[1] Appropriate work is shown, but one graphing error is made, such as writing an incorrect scale on the number line.

or [1] Appropriate work is shown, but one conceptual error is made, such as using a closed circle instead of an open circle.

or [1] A correct inequality is written, but the graph is not drawn.

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

[64] incorrect procedure.

[2] 65, and appropriate work is shown, such as solving the inequality $15x \geq 225 + 750$ 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] 65, but no work or fewer than three trials and 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

[65] incorrect procedure.

[3] 7, and appropriate work is shown, such as solving the inequality $15x + 22 \geq 120$, solving an equation, or trial and error with at least three trials and appropriate checks.

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

or [2] The trial-and-error method is used to find a correct solution, but only two trials and appropriate checks are shown.

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

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

or [1] An incorrect equation of equal difficulty is solved appropriately.

or [1] A correct inequality or equation is written, but no further correct work is shown.

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] 7, but no work or only one trial with an appropriate check is shown.

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

[66] incorrect procedure.

[67] D

[68] C

[2] 6, and appropriate work is shown, such as $0.70x + 0.30 \leq 5.00$ or trial and error with three trials and appropriate checks.

[1] The inequality is solved correctly, but the number of doughnuts is not found.

or [1] The trial-and-error method is used to find a correct solution, but fewer than three trials are shown.

or [1] 6, 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

[69] incorrect procedure.

[3] 15 and an appropriate method or explanation is shown, such as trial and error or the inequality $6x + 15 \geq 100$.

[2] An appropriate method is shown, but it stops at 14.

[1] An appropriate method is shown, but no answer is found.

or [1] 15 and no explanation is given.

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

[70] incorrect procedure.

[71] B