# Section 4-4: Using Formulas to Solve Problems

1. 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

2. 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°

3. 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.

4. 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?

5. 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

6. 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?

7. 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

8. 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?
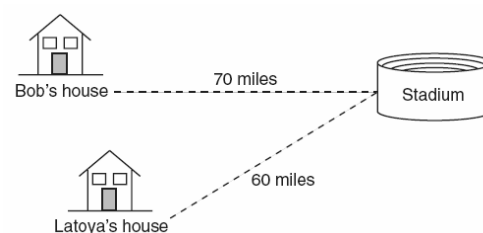
9. 010125a, P.I. A.M.1
   Two trains leave the same station at the same time and travel in opposite directions. One train travels at 80 kilometers per hour and the other at 100 kilometers per hour. In how many hours will they be 900 kilometers apart?

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10. 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?

11. 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

12. 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

13. 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?
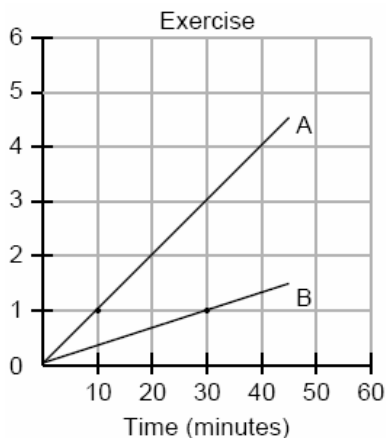
14. 080736a, P.I. A.M.1
    The trip from Manhattan to Montauk Point is
    120 miles by train or by car. A train makes
    the trip in 2 hours, while a car makes the trip
    in $2\frac{1}{2}$ hours. How much faster, in miles per
    hour, is the average speed of the train than the
    average speed of the car?

15. 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?

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

17. 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

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18. 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] $\frac{4}{5}$

19. 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] $5n + 2$

20. 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.
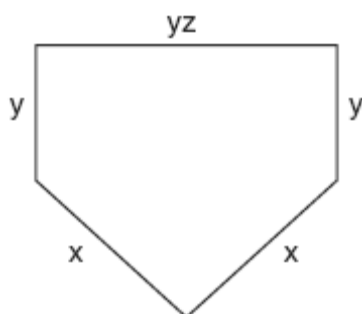
Which expression represents the perimeter of the figure?

[A] $2x + 3yz$ [B] $2x + 2y + yz$

[C] $5xyz$ [D] $x^2 + y^3z$

21. 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.

22. 080537a

In the accompanying diagram, the perimeter of ΔMNO 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.

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