

8-2 Word Problem Practice

Multiplying a Polynomial by a Monomial

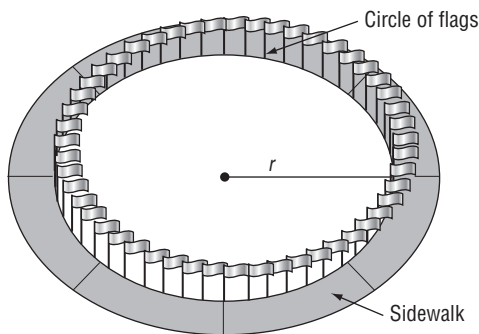
- 1. NUMBER THEORY** The sum of the first n whole numbers is given by the expression $\frac{1}{2}(n^2 + n)$. Expand the equation by multiplying, then find the sum of the first 12 whole numbers.

$$\frac{n^2}{2} + \frac{n}{2}; 78$$

- 2. COLLEGE** Troy's boss gave him \$700 to start his college savings account. Troy's boss also gives him \$40 each month to add to the account. Troy's mother gives him \$50 each month, but has been doing so for 4 fewer months than Troy's boss. Write a simplified expression for the amount of money Troy has received from his boss and mother after m months.

$$\$90m + \$500$$

- 3. LANDMARKS** A circle of 50 flags surrounds the Washington Monument. Suppose a new sidewalk 12 feet wide is installed just around the outside of the circle of flags. The outside circumference of the sidewalk is 1.10 times the circumference of the circle of flags.



Write an equation that equates the outside circumference of the sidewalk to 1.10 times the circumference of the circle of flags. Solve the equation for the radius of the circle of flags. Recall that circumference of a circle is $2\pi r$.

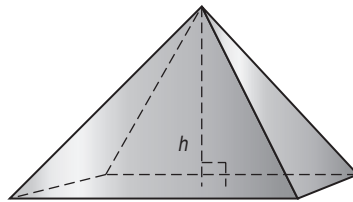
$$1.10(2\pi r) = 2\pi(r + 12); r = 120 \text{ ft}$$

- 4. MARKET** Sophia went to the farmers' market to purchase some vegetables. She bought peppers and potatoes. The peppers were \$0.39 each and the potatoes were \$0.29 each. She spent \$3.88 on vegetables, and bought 4 more potatoes than peppers. If x = the number of peppers, write and solve an equation to find out how many of each vegetable Sophia bought.

$$\$3.88 = x(0.39) + (x + 4)(0.29);$$

4 peppers and 8 potatoes

- 5. GEOMETRY** Some monuments are constructed as rectangular pyramids. The volume of a pyramid can be found by multiplying the area of its base B by one third of its height. The area of the rectangular base of a monument in a local park is given by the polynomial equation $B = x^2 - 4x - 12$.



- a. Write a polynomial equation to represent V , the volume of a rectangular pyramid if its height is 10 centimeters.

$$V = \frac{10}{3}x^2 - \frac{40}{3}x - 40$$

- b. Find the volume of the pyramid if $x = 12$.

$$280 \text{ cm}^3$$