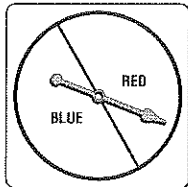


8-4 Word Problem Practice

Special Products

1. **PROBABILITY** The spinner below is divided into 2 equal sections. If you spin the spinner 2 times in a row, the possible outcomes are shown in the table below.

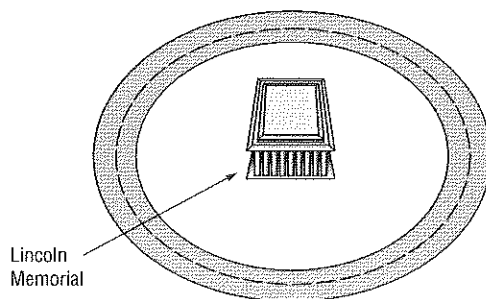


red	blue
red	red
red	blue
blue	blue

What is the probability of spinning a blue and a red in two spins?

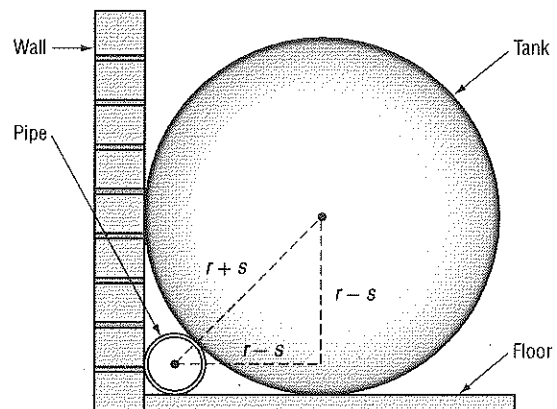
2. **GRAVITY** The height of a penny t seconds after being dropped down a well is given by the product of $(10 - 4t)$ and $(10 + 4t)$. Find the product and simplify. What type of special product does this represent?

3. **TRAFFIC PLANNING** The Lincoln Memorial in Washington, D.C., is surrounded by a circular drive called Lincoln Circle. Suppose the National Park Service wants to change the layout of Lincoln Circle so that there are two concentric circular roads. Write a polynomial equation for the area A of the space between the roads if the radius of the inside road is 10 meters less than the radius of the outside road.



4. **BUSINESS** The Combo Lock Company finds that its profit data from 2005 to the present can be modeled by the function $y = 4n^2 + 44n + 121$, where y is the profit n years since 2005. Which special product does this polynomial demonstrate? Explain.

5. **STORAGE** A cylindrical tank is placed along a wall. A cylindrical PVC pipe will be hidden in the corner behind the tank. See the side view diagram below. The radius of the tank is r inches and the radius of the PVC pipe is s inches.

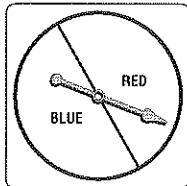


- Use the Pythagorean Theorem to write an equation for the relationship between the two radii. Simplify your equation so that there is a zero on one side of the equals sign.
- Write a polynomial equation you could solve to find the radius s of the PVC pipe if the radius of the tank is 20 inches.

8-4 Word Problem Practice

Special Products

1. **PROBABILITY** The spinner below is divided into 2 equal sections. If you spin the spinner 2 times in a row, the possible outcomes are shown in the table below.



red	blue
red	red
red	blue
blue	blue

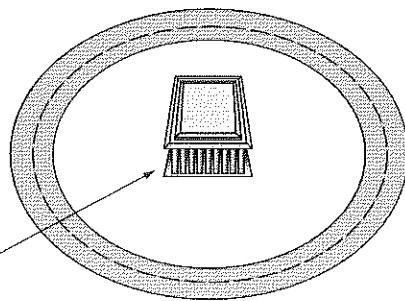
What is the probability of spinning a blue and a red in two spins? **50%**

2. **GRAVITY** The height of a penny t seconds after being dropped down a well is given by the product of $(10 - 4t)$ and $(10 + 4t)$. Find the product and simplify. What type of special product does this represent?

$100 - 16t^2$; product of a sum and difference

3. **TRAFFIC PLANNING** The Lincoln Memorial in Washington, D.C., is surrounded by a circular drive called Lincoln Circle. Suppose the National Park Service wants to change the layout of Lincoln Circle so that there are two concentric circular roads. Write a polynomial equation for the area A of the space between the roads if the radius of the inside road is 10 meters less than the radius of the outside road.

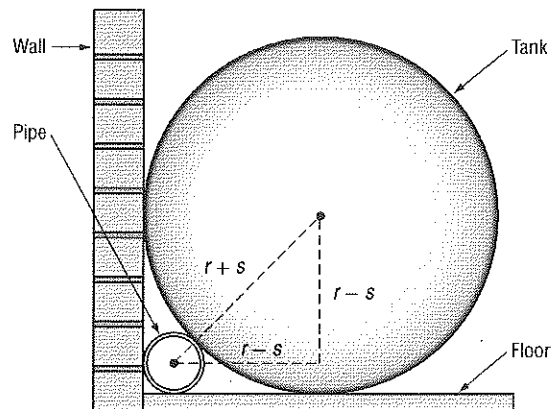
$A = 20\pi r - 100\pi$



4. **BUSINESS** The Combo Lock Company finds that its profit data from 2005 to the present can be modeled by the function $y = 4n^2 + 44n + 121$, where y is the profit n years since 2005. Which special product does this polynomial demonstrate? Explain.

square of a sum; it can also be written as $(2n + 11)^2$

5. **STORAGE** A cylindrical tank is placed along a wall. A cylindrical PVC pipe will be hidden in the corner behind the tank. See the side view diagram below. The radius of the tank is r inches and the radius of the PVC pipe is s inches.



- a. Use the Pythagorean Theorem to write an equation for the relationship between the two radii. Simplify your equation so that there is a zero on one side of the equals sign.

$0 = r^2 - 6rs + s^2$

- b. Write a polynomial equation you could solve to find the radius s of the PVC pipe if the radius of the tank is 20 inches. **$0 = s^2 - 120s + 400$**