

STEM *Sims*™

# Zero Sum Security



# ZeroSumSecurity

**Do you need an idea for a scientific study?  
Try out one of our ideas or make one of your own.**

**Start learning right now about how security forces plan and secure ports from attacks. Take the following brief quiz to see how much you already know about protecting a port. See the bottom of page 4 to check your answers.**

1. Port security gained prominence politically in 2006 due to the sale of British company P&O Ports (including its American port assets) to:
  - a. Dubai Ports World.
  - b. Shanghai.
  - c. United States.
  - d. United Arab Emirates.
2. In the United States, port security is handled jointly by the Coast Guard and U.S. Customs and Border Protection, both components of the:
  - a. Secretary of Security.
  - b. Department of Homeland Security.
  - c. Department of Defense.
  - d. National Security Agency.
3. Local law enforcement agencies and the \_\_\_\_\_ also have a role in port security at the local and regional level.
  - a. Central Intelligence Agency
  - b. Federal Bureau of Investigation
  - c. Defense Intelligence Agency
  - d. National Security Agency
4. The new attention to port security that the port sale controversy generated led to the passage of the:
  - a. United States Coast Guard.
  - b. SAFE Port Act.
  - c. Anti-terrorism Playbook.
  - d. Secure and Safe bill.
5. Which of the following is *not* required to embark on a cruise ship as a passenger over the age of 18 in a United States port?
  - a. a valid ID
  - b. have your picture taken
  - c. have your luggage screened
  - d. a major credit card

## A Zero-Sum Game

The phrase, “zero-sum game” represents a host of activities in which any gains or wins by one person or player must be equal to the losses of another person. For instance, if two people are playing poker against each other and one person wins \$10, the other player must have lost \$10. In a two-person zero-sum game, only one player can win and the other player must lose.

Solve the following problems by placing the correct operation symbol (+, −, ×, and ÷) in the correct location between two adjacent numbers to make the series of numbers equal exactly zero. Operation symbols can be used more than once or not at all in a given problem.

1. 5  3  6  1  1  8 = 0
2. 2  4  1  1  5  1 = 0
3. 4  2  3  2  2  2 = 0
4. 2  1  1  7  9  1 = 0
5. 4  3  2  2  1  7 = 0

## Tradeoffs

A tradeoff is a forced-choice process in which you have to make a decision as to which one of multiple choices you wish to select. However, by selecting one you eliminate the possibility of selecting the other options. For instance, if you can have the option of only having two toppings on your pizza, you have to make a decision on which toppings you select and which ones you decide not to include on your pie.

The notion of tradeoffs can be coupled with the zero-sum game concept and applied to real-life situations. Your personal allowance budget is an excellent example of the marriage of tradeoffs and zero-sum concepts. Let’s say that you have an allowance of \$20 and that you have to decide on how much to spend on each of the activities listed in the table below. You cannot spend more than \$20, and in this case you must spend the entire \$20. For each Item/Activity, choose how much of your allowance you wish to spend this week by placing a checkmark in the appropriate box. Remember, all of your selections must add up to exactly \$20 and no more!

<i>Item/Activity</i>	<i>\$0</i>	<i>\$5</i>	<i>\$10</i>	<i>\$15</i>	<i>\$20</i>
<b>New clothes</b>					
<b>Attend concert</b>					
<b>Donate to charity</b>					
<b>Buy music</b>					

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## Port Security

Managers of port security must play a zero-sum game when they decide on how best to protect their ports. Any movement of security forces from one location weakens that location while strengthening another one. Difficult decisions as to where to place strengthened security forces must constantly be evaluated and re-evaluated by port security managers to provide the best overall protection given both known and unknown security threats.



In recent years, a number of terrorists have coupled their attacks to make the largest impact on the damage done to civilians and security forces. As people rush to one location to help injured people, a second bomb will be detonated at that location. Many terrorists count on good humanitarians rushing in to help others to maximize the damage done. As horrible as this notion seems, effective security managers must take into account all possible scenarios to determine their plan to protect the people in their facility.

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**Answers:** 1) a. 2) b. 3) b. 4) b. 5) d. Zero-Sum Game Answers (One possible solution for each problem, other solutions might exist): 1)  $5 \times 3 - 6 \times 1 - 1 - 8$ , 2)  $2 + 4 + 1 - 1 - 5 - 1$ , 3)  $4 + 2 \times 3 - 2 - 2 - 2$ , 4)  $2 + 1 \times 1 + 7 - 9 - 1$ , 5)  $4 + 3 + 2 - 2 \times 1 - 7$ . Tradeoffs: Answers will vary, but the total of all checkmarks must sum to exactly \$20.

The Science Fair Kits project was funded in part under the Department of Homeland Security Science and Technology Directorate grant contract #N10PC20003. Its contents are solely the responsibilities of the authors and do not necessarily represent the official views of the Department of Homeland Security.

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