Algebra 1 – Semester 1

Tips on how to successfully complete:

1.11.2 Project: Performance Task: A Trade Show Booth

See next page for tips on the assignment itself.
1.11.2 Project: Performance Task: A Trade Show Booth

The Scenario: Your manager has asked you to help plan your company's participation at a local trade show. You have $6300 to spend on the booth space, promotional items, and product brochures. Use what you know about solving equations and inequalities to prepare a proposal that meets the budget.

The Project: Use the information provided in the Performance Task to learn more about the costs of renting a booth space, printing product brochures, and ordering promotional items. See what you can discover about each of these tasks before you write your proposal showing your manager how you've prepared for the tradeshow and stayed within budget.

The questions below will help you gather information and get your tradeshow planning off on the right track.

Choosing a Booth Location: Your manager is sending two people to work at the conference. She wants a booth that will give your company good visibility for no more than one third of the total budget ($6300). The conference coordinator just told you there are only five booths left. Which booth will you choose?

Step 1: Understand the Problem

What do you know?

1. List three things you know about the requirements of the booth space. (3 points)

   1. 
   2. 
   3. 

What is the question asking?
2. Summarize what you are being asked to do. (1 point)
   (in a sentence or two)

Step 2: Plan How to Solve the Problem

Define each quantity. (Note: you have not actually chosen a booth yet. You'll do that in #10)

3. How much money are you starting with? (1 point)

4. How much money do you need to have left after renting a booth? (1 point)

5. What variable will you use to represent the cost of the booth? (1 point)
Write an inequality.

6. Write an expression to show how much money you will have after you rent the booth. (1 point)

7. Write an inequality that shows how much money you need left over. (1 point)

Step 3: Solve the Problem

Solve the inequality.

8. Solve your inequality for the cost of the booth. (3 points)

Interpret the solution.

9. What does this tell you about how much you can afford to spend on a booth? (1 point)
10. Which booth (1-5) did you select, and how much did it cost? (1 point)

Keep in mind how much you can afford (see #8 & #9)

11. Explain why you chose this booth location. Talk about location, staffing, and cost. (3 points)

12. How much money will you have left after you rent this booth? Show your calculation (1 point)

Substitute cost of booth you chose into your expression from #6.

Printing Brochures You were told to call Sofia to order more full-color product brochures. The trade show is less than three weeks away. Your manager wants you to get a supply big enough for the nearly 3100 expected attendees. She said the order should be $1900 or less so that you will have enough money left in the budget for promotional items.
Step 1: Understand the Problem

What do you know?

13. List three criteria for the print order that you know are important to your manager. (3 points)

   1.
   2.
   3.

What did you discover?

14. List three pieces of information you learned from talking to Sofia. (3 points)

   1.
   2.
   3.

Step 2: Plan How to Solve the Problem

Define each quantity.

15. What variable will you use to represent the number of brochures? (1 point)
16. What is the cost of each brochure based on the number you need to order? (1 point)

Brochures have two prices depending on how many you need.

17. If extra costs need to be included, how much are they? (1 point)

Think about how long it takes for the order to arrive & how soon the tradeshow is happening.

18. How much money can you spend on the brochure order? (1 point)

19. Write an expression that shows the cost of the brochures. (1 point)

Expression should account for #16 & #17.
Write an inequality.

20. Write an inequality to show how much you can spend on the brochure order. (1 point)

Step 3: Solve the Problem

Solve the inequality.

21. Solve your inequality for the number of brochures. (3 points)

Interpret the solution.

22. What does this tell you about how many brochures you can order? (1 point)
Make your choice.

23. Fill out this order form to complete the brochure order. (7 points, 1 for each table cell).

<table>
<thead>
<tr>
<th>Order Form</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>To:</td>
<td>hb</td>
</tr>
<tr>
<td>From:</td>
<td></td>
</tr>
<tr>
<td>Fax: 1-800-QWK-PRNT</td>
<td></td>
</tr>
<tr>
<td>Pages: 1</td>
<td></td>
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<tr>
<td>Phone: 1-800-PRNT-QWK</td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td></td>
</tr>
<tr>
<td>Re: Brochure Order</td>
<td></td>
</tr>
<tr>
<td>cc: Manager</td>
<td></td>
</tr>
<tr>
<td>Quantity: How many brochures?</td>
<td>3</td>
</tr>
<tr>
<td>Price: $0.40 each for 1000 or more $0.60 each for 999 or fewer</td>
<td>4</td>
</tr>
<tr>
<td>Cost: Quantity x Price</td>
<td>7</td>
</tr>
<tr>
<td>Rush Order: Add $50 to cost if required within 2 weeks</td>
<td>6</td>
</tr>
<tr>
<td>Total Cost</td>
<td>3</td>
</tr>
</tbody>
</table>

24. Explain how you decided on the number of brochures to order and whether to opt for the rush order delivery. (2 points)

Selecting Promotions You need two different promotional items to give away to the trade show attendees. Remember, there are nearly 3100 people expected. Your manager asked you to leave 10% of the total budget for last-minute expenses. So keep in mind how much the booth and the brochures cost, and decide which two items you want to order (and how many of each).

Step 1: Understand the Problem

What do you know?
25. List three criteria for the promotional item order that you know are important to your manager. (3 points)

1. 
2. 
3. 

What did you discover?

26. What did you learn about the costs of the promotional items? (8 points, 1 point for each cell)

<table>
<thead>
<tr>
<th>Item</th>
<th>Price (each)</th>
<th>Setup Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sportpack</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sport Bottle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USB Drive</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Step 2: Plan How to Solve the Problem

Define each quantity.

27. How much did you spend on the booth and the brochures? Describe and show your calculation. (2 points)

see #10  see #23
28. How much money do you have left? (1 point)

29. What is 10% of the original budget? Show your calculation. (1 point)

30. If you must save 10% of the original budget how much of your remaining money can you spend on promotional items? (1 point) #28

31. Which two items do you want to order? (2 points: 1 for each item)

32. What variables will you use to represent those items? (2 points: 1 for each variable)
Write an inequality.

33. Write an expression that shows the cost of each of the items you want to order. (2 points: 1 for each inequality).

Cost of item 1:

Cost of item 2:

34. Write an inequality to show how much you can spend on the promotional item order. (1 point)

Cost of item 1 + Cost of item 2 ≤ $ you can spend on promo order

Step 3: Solve the Problem

35. Solve your inequality, first for one of the promotional items, then for the other. (8 points: 4 points for each solution)
Example similar to # 35:

\[ 3x + 4y \leq 15 \]

Solve your inequality, first for one of the promotional items, then for the other.

For \( x \) and \( y \):

- Solve for \( x \):
  \[
  3x + 4y \leq 15 \\
  \underline{-4y \quad -4y} \\
  3x \leq -4y + 15 \\
  \frac{3x}{3} \leq \frac{-4y + 15}{3} \\
  x \leq -1.33y + 5
  \]

- Solve for \( y \):
  \[
  3x + 4y \leq 15 \\
  \underline{-3x \quad -3x} \\
  4y \leq -3x + 15 \\
  \frac{4y}{4} \leq \frac{-3x + 15}{4} \\
  y \leq -0.75x + 3.75
  \]

First inequality rewritten is solved for first variable (item).

Second inequality rewritten is solved for second variable (item).
Interpret the solution.

36. If you order 500 of the first item, how many of the second item can be ordered? Show your work. (4 points: 3 points for showing work, 1 for answer)

37. Check your answer. Does it make sense? Show your work. (3 points: 2 for showing work, 1 for answer).

38. Explain whether or not the order in question 36 would meet your needs. (2 points)

Refer back to #25

39. If you order 500 of the second item, how many of the first item can be ordered? Show your work. (4 points, 3 points for showing work, 1 point for answer)
40. Check your answer. Does it make sense? **Show your work.** (3 points. 2 for showing work, 1 for answer).

41. Explain whether the order in question 39 would meet your needs. (2 points)

42. Complete your promotional item order by entering the following on the order form:
- The quantity for both items you chose
- The cost for each item being ordered
- The total number of items in the order
- The total cost of the order

(9 points)

<table>
<thead>
<tr>
<th>Promotional Item</th>
<th>Price</th>
<th>Quantity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sportpack</td>
<td>$1.50 each + $30.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pen</td>
<td>$0.40 each + $15.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sport Bottle</td>
<td>$2.00 each + $40.00</td>
<td></td>
<td></td>
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<tr>
<td>USB Drive</td>
<td>$3.50 each + $25.00</td>
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<tr>
<td>Totals</td>
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</table>
43. Explain how you decided on the items and quantities to order. (2 points)

Your Proposal Now it's time to show your manager the plans for the trade show. Impress her with a job well done by showing that you met the criteria for booth space, brochures, and promotional items, all while staying within the overall budget.

44. Complete the report below so your manager knows the decisions you've made and understands how the budget has been spent. Enter the following on the order form:

- A description of each item. (2 points for each cell)
- The reasoning you used to make your decision about that item. (2 points for each cell)
- Cost of each item order (1 point for each cell)
- Total cost of plan (1 point)
- Money remaining (1 point)

(17 points) total

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Reasoning</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booth</td>
<td>Booth number? Size? Location? Staff required?</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Brochures</td>
<td>Quantity? Extra fees?</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

Money remaining: $0
<table>
<thead>
<tr>
<th>Promotional Items</th>
<th>Quantity?</th>
<th>Color?</th>
<th>Shipping time?</th>
<th>Special features?</th>
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</tbody>
</table>

| Total Cost | 2 |
| Money Remaining (Goal: at least $630) | (compared to original budget) |

Current money remaining: 1

sum of costs

Whew! You made it!