

# Keystone Algebra 1

*John Buys Supplies*

Handscoring  
Anchor Set

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## PA Keystone Algebra 1: John Buys Supplies

16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

B. How many packages of towels does John buy?

## PA Keystone Algebra 1: John Buys Supplies

16. ***Continued.*** Please refer to the previous page for task explanation.

C. Explain why it would **not** be possible for John to buy exactly 16 bars of soap.

# PA Keystone Algebra 1: John Buys Supplies

## Keystone Algebra 1 John Buys Supplies

**Assessment Anchor this item will be reported under:**

**A1.1.2 Linear Equations**

**Specific Eligible Content addressed by this item:**

**A1.1.2.2.1** Write and/or solve a system of linear equations (including problem situations) using graphing, substitution, and/or elimination.

**A1.1.2.2.2** Interpret solutions to problems in the context of the problem situation.

**Scoring Guide:**

Score	In this item, the student –
4	Demonstrates a thorough understanding of how to write and solve a system of linear equations (including problem situations) using substitution or elimination and interpret solutions to problems in the context of the problem situation by correctly solving problems and clearly explaining procedures.
3	Demonstrates a general understanding of how to write and solve a system of linear equations (including problem situations) using substitution or elimination and interpret solutions to problems in the context of the problem situation by correctly solving problems and clearly explaining procedures with only minor errors or omissions.
2	Demonstrates a partial understanding of how to write and solve a system of linear equations (including problem situations) using substitution or elimination and interpret solutions to problems in the context of the problem situation by correctly performing a significant portion of the required task.
1	Demonstrates minimal understanding of how to write and solve a system of linear equations (including problem situations) using substitution or elimination and interpret solutions to problems in the context of the problem situation.
0	The response has no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task. Response may show only information copied from the question.
Non-scorables	B – Blank, entirely erased or written refusal to respond F – Foreign Language K – Off-task U – Unreadable

# PA Keystone Algebra 1: John Buys Supplies

## Top Scoring Student Response And Training Notes:

Score	Description
4	Student earns 4 points.
3	Student earns 3 points.
2	Student earns 2 points.
1	Student earns 1 point. OR Student demonstrates minimal understanding of how to write and solve a system of linear equations (including problem situations) using substitution or elimination and interpret solutions to problems in the context of the problem situation.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

A.

What?	Why?
$t + s = 20$ <b>OR equivalent</b> <b>AND</b> $6t + 4s = 94$ <b>OR equivalent</b>	

(2 score points)

1 point for each correct equation

B.

What?	Why?
7 (packages of towels) [Note: carry over any errors from part A]	

(1 score point)

1 point for correct answer

C.

What?	Why?
	Since John is buying soap in packages of ten bars, the number of bars of soap he buys must be a multiple of 10. Since 16 is not a multiple of 10, it would not be possible for John to buy exactly 16 bars of soap. <b>OR equivalent</b>

(1 score point)

1 point for complete explanation

John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

- A. Write a system of two equations to represent the packages of cleaning supplies John buys.

20 = t + s  
94 = 6t + 4s

15 / 200

- B. How many packages of towels does John buy?

7

1 / 50

- C. Explain why it would **not** be possible for John to buy exactly 16 bars of soap.

Because 16 is not a multiple of 10 and the package contains 10 bars of soap.

76 / 1000

4

- A. 2 points – two correct equations.  
B. 1 point – correct answer. Note that *no support is required*.  
C. 1 point – complete explanation.

16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$\begin{aligned}6t + 4s &= 94 \\ t + s &= 20\end{aligned}$$

B. How many packages of towels does John buy?

John buys  
7 packages of towels.

4

- A. 2 points – two correct equations.  
B. 1 point – correct answer.  
C. 1 point – complete explanation.



16. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

It isn't possible for John  
to buy exactly 16 bars  
of soap because each  
package of soap contains  
10 bars of soap.

John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

- A. Write a system of two equations to represent the packages of cleaning supplies John buys.

EQ

$t+s=20$   $4s+6t=94$

17 / 200

- B. How many packages of towels does John buy?

EQ

7

1 / 50

- C. Explain why it would **not** be possible for John to buy exactly 16 bars of soap.

EQ

It's not possible for John to buy exactly 16 bars of soap because if you reentered it into the equations  $t+s=20$  and  $6t+4s=94$  he would come up 6 dollars short.

156 / 1000

3

- A. 2 points – two correct equations.  
B. 1 point – correct answer.  
C. 0 points – incorrect explanation.

16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$6t + 4s = 94$$

↓

$$t + s = 20$$

B. How many packages of towels does John buy?

$$6(9) + 4(10) = 94$$

$$54 + 40 = 94$$

$$94 = 94$$

$$\left\{ \begin{array}{l} t = 9 \\ 9 \text{ packages} \end{array} \right\}$$

3

- A. 2 points – two correct equations.  
B. 0 points – incorrect answer.  
C. 1 point – complete explanation.

16. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

A package of soap contains 10 bars of soap in it, we can't determine how much the store wants for each individual bar so he cannot buy it

16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$t \cdot 6 + s \cdot 4 = 94$$

B. How many packages of towels does John buy?

8 packages

2

- A. 1 point – one correct equation.  
B. 0 points – incorrect answer.  
C. 1 point – complete explanation.

16. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

It is not possible because each package contains 10 bars. So if he buys one package he has 10. If he buys 2 packages. He has 20 bars.

16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$\begin{aligned} 6t + 8 &= 20 \\ 4s + 10 &= 20 \end{aligned}$$

B. How many packages of towels does John buy?

20 packages

$$\begin{aligned} \$4 \cdot 13 &= \$52 \\ \$6 \cdot 7 &= \$42 \\ \hline &\$94 \end{aligned}$$

Towels = 7 packages

2

- A. 0 points – two incorrect equations.  
 B. 1 point – correct answer. Note that the expected correct answer, “7 (packages)”, always receives credit.  
 C. 1 point – complete explanation.

16. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

It would not be possible because there are only 10 bars of soap in each package if you got two packages it would be 20 bars. So that is why it is not possible.



16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$\underline{6(t) + 4(s) = 20}$$

B. How many packages of towels does John buy?

$$\begin{array}{r} 94/6 \\ 15.6\bar{6} \end{array}$$

John buys 15 packages of towels.

- 1
- A. 0 points – one incorrect equation, “ $6(t) + 4(s) = 20$ ”.
  - B. 0 points – incorrect answer, “15”. Note that this is *neither* the expected correct answer *nor* based on a system of equations in part A.
  - C. 1 point – complete explanation.

16. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

It is not possible for John to buy exactly 16 bars of soap because each box comes with 10 bars. John can either buy 1 box of 10 soaps or 2 boxes of 20 soaps. If John needs 16 bars of soap he should buy 2 boxes giving him 4 more than he needs.

John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

- A. Write a system of two equations to represent the packages of cleaning supplies John buys.

eq1
$20 = 6t + 8$ $20 = 4s + 10$

16 / 200

- B. How many packages of towels does John buy?

eq2
120

3 / 50

- C. Explain why it would **not** be possible for John to buy exactly 16 bars of soap.

eq3
each package has 10 bars of soap in it

38 / 1000

1

- A. 0 points – two incorrect equations.  
B. 0 points – incorrect answer.  
C. 1 point – complete explanation.

16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$6t + 4s = 94$$
$$8t + 10s = 20$$

B. How many packages of towels does John buy?

$$94/6 = 15$$

1

- A. 1 point – one correct equation, “ $6t + 4s = 94$ ”.
- B. 0 points – incorrect answer.
- C. 0 points – incorrect explanation.

16. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

BECAUSE IT COMES OUT AS  
A DECIMAL AND YOU  
CAN'T BUY A DECIMAL OF  
SOMETHING.

John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

- A. Write a system of two equations to represent the packages of cleaning supplies John buys.

eq1

$$8t = 6$$
$$10s = 4$$

10 / 200

- B. How many packages of towels does John buy?

eq2

$$12$$

2 / 50

- C. Explain why it would **not** be possible for John to buy exactly 16 bars of soap.

eq3

John can not buy exactly 16 bars of soap because he already bought enough for only 16 packages of towels. John can only buy 4 packages of soap to equal \$94

156 / 1000

0

- A. 0 points – two incorrect equations.  
B. 0 points – incorrect answer.  
C. 0 points – incorrect explanation.

# Keystone Algebra 1

*John Buys Supplies*

Handscoring  
Training Set 1

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16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$6t + 4s = 94$$
$$1/8t + 1/10s = 20$$

B. How many packages of towels does John buy?

7

16. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

It is not possible because there are 10 bars in each package.

John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

- A. Write a system of two equations to represent the packages of cleaning supplies John buys.

eq1
$6 + 8t = 94$ $4 + 10s = 94$

16 / 200

- B. How many packages of towels does John buy?

eq1
11 packages of towels

21 / 50

- C. Explain why it would **not** be possible for John to buy exactly 16 bars of soap.

eq1
Because if John bought 11 packages of towels and spent \$94 for his total, then there could not be any way that he got 16 bars of soap instead of 9. Unless there was a sale or the prices were changed.

199 / 1000

16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$8t + 10s = 20$$

$$6t + 4s = 94$$

B. How many packages of towels does John buy?

9 packages

16. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

Because then, to make your total \$14 you would have to buy 5 packages of towels which would make you buy 21 packages of cleaning products.

16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$\begin{aligned}t + s &= 20 \text{ packages} \\ \$6t + \$4s &= \$94\end{aligned}$$

B. How many packages of towels does John buy?

John buys 7 packages of towels.

16. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

It would not be possible for John to buy exactly 16 bars of soap, because, they only come in packs of 10 and 10 doesn't divide evenly into 16 and he can't buy a fraction of a pack.

16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$\text{eq. 1} \rightarrow \$6t + 4s = \$94$$

$$\text{eq. 2} \rightarrow t + s = 20$$

B. How many packages of towels does John buy?

John buys 7 packages of towels.

$$6t + 4s = 94$$

$$6(7) + 4(13) = 94$$

$$t + s = 20$$

$$7 + 13 = 20$$



16. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

John would not be able to buy exactly 16 bars of soap because the soap only contains 10 bars of soap. John can either purchase one container that has 10 soaps or 2 containers which add up to 20 bars of soap.

16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$94 = t(6)$$

$$94 = s(4)$$

B. How many packages of towels does John buy?

$$17(6) = 102$$

$$42 + 52 = 94$$

$$13(4) = 52$$

John brought 7 packages of towels

16. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

It would not be possible for John to buy 16 bars of soap because each package contains 10 bars of soap. So if you buy two packages of soap you will have 20 bars of soap.

John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

- A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$8t + 10s = 20$ $\$6t + \$4s = \$94$
-----------------------------------------

22 / 200

- B. How many packages of towels does John buy?

2 packages
------------

10 / 50

- C. Explain why it would **not** be possible for John to buy exactly 16 bars of soap.

It would not be possible for John to buy 16 bars of soap because it would cost more than \$94 dollars.
--------------------------------------------------------------------------------------------------------

97 / 1000

John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

- A. Write a system of two equations to represent the packages of cleaning supplies John buys.

eq1

$$\begin{aligned}6t + 4s &= \$96 \\ t &= 20 - s\end{aligned}$$

16 / 200

- B. How many packages of towels does John buy?

eq2

8 packages of paper towels

26 / 50

- C. Explain why it would **not** be possible for John to buy exactly 16 bars of soap.

eq3

It would not be possible for John to buy exactly 16 bars of soap because there are 10 bars of soap in each package, so if he bought one package he would have 10 bars of soap, and if he bought 2 packages he would have 20 bars of soap, (over 16).

244 / 1000

16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$\begin{array}{r} 94 \\ \underline{+} \end{array} \quad \begin{array}{r} 6 \\ \underline{+} \end{array} \quad \begin{array}{r} 8 \\ \underline{+} \end{array} \quad \begin{array}{r} 3 \\ \underline{+} \end{array} \quad \begin{array}{r} 4 \\ \underline{+} \end{array} \quad \begin{array}{r} 10 \\ \underline{+} \end{array} \quad \begin{array}{r} 20 \\ \underline{+} \end{array}$$

B. How many packages of towels does John buy?

John buys 12  
packages of towels.

16. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

It would not be possible  
because John doesn't have  
the right enough amount of  
money to get exactly 16 bars of  
soap.

16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$t + s = 20$$

$$6t + 4s = 94$$

B. How many packages of towels does John buy?

7 packs of towels



16. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

Its not possible because soap is only sold in packages of 10.

Subject: Algebra 1

Item: John Buys Supplies

Name \_\_\_\_\_

Number	Score	Notes
T1-1		
T1-2		
T1-3		
T1-4		
T1-5		
T1-6		
T1-7		
T1-8		
T1-9		
T1-10		

# Keystone Algebra 1

*John Buys Supplies*

Handscoring  
Training Set 2

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16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$\begin{aligned} y &= 6t \\ x &= 4s \end{aligned}$$

B. How many packages of towels does John buy?

towels

$$\begin{aligned} y &= 6 \cdot 8 \\ x &= 48 \end{aligned}$$

soap

$$\begin{aligned} x &= 6 \cdot 12 \\ x &= 72 \\ x &= 48 \end{aligned}$$

John buys 8 packages of towels.

16. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

It is not possible for John to buy 16 bars of soap because there is 10 bars in each package. Since 16 is not a multiple of 10 John can't get 16 bars of soap.

John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

- A. Write a system of two equations to represent the packages of cleaning supplies John buys.

8 / 200

$6t + 4s = 94$

8 / 200

- B. How many packages of towels does John buy?

1 / 50

7

1 / 50

- C. Explain why it would **not** be possible for John to buy exactly 16 bars of soap.

527 / 1000

It is not possible for John to buy exactly 16 bars of soap. If John bought 16 bars of soap, that would cost 64 dollars. Then, since he only purchased 20 packages, he would have to buy 4 packages of towels. The 4 packages of towels would cost 24 dollars. Next, when you add the cost of the towels and soap together, you see that they only cost 88 dollars combined. The problem is that John spent 94 dollars on these items, and not 88 dollars. As you can see, it is impossible for John to buy exactly 16 bars of soap.

527 / 1000

16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$\begin{cases} t + s = 20 \\ 6t + 4s = 94 \end{cases}$$

B. How many packages of towels does John buy?

7 packages of towels



16. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

It wouldn't be possible be the soap comes in packages of 10 bars. He would have need packages with 1, 2, 4, 8, or 16 bars of soap each. Not 10.

John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

- A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$t = 6x + 20$   
 $s = 4x + 20$

15 / 200

- B. How many packages of towels does John buy?

7

1 / 50

- C. Explain why it would **not** be possible for John to buy exactly 16 bars of soap.

John can not buy 16 bars of soap because each package has 10 bars of soap in them.

83 / 1000

John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

- A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$20 = s + t$$
$$94 = 4s + 6t$$

15 / 200

- B. How many packages of towels does John buy?

7 packages of towels

20 / 50

- C. Explain why it would **not** be possible for John to buy exactly 16 bars of soap.

Because each package comes with ten bars of soap and sixteen is not a multiple of ten. Therefore, it is impossible to buy exactly sixteen bars of soap.

151 / 1000

16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$6t + 4s = 94$$
$$t + 10s = 20$$

B. How many packages of towels does John buy?

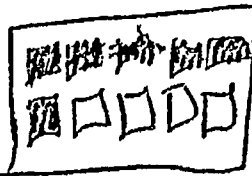
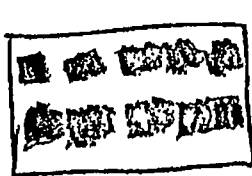
7 packages

16. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

It would not be possible for John to buy exactly 16 bars of soap, because the packages of soap only come in packs of 10. You can't get 16 from 10 it's not possible. (Look at example) You are only able to get boxes of 10 bars. So multiples of 10 like 10, 20, 30, 40 and so on, but not 16.

ex.



$$10 + 10 = 20$$

John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

- A. Write a system of two equations to represent the packages of cleaning supplies John buys.

60
$6t + 7 = 94$ $4s + 10 = 20$

16 / 200

- B. How many packages of towels does John buy?

60
14.5

4 / 50

- C. Explain why it would **not** be possible for John to buy exactly 16 bars of soap.

60
it is not possible for johnny to but exactly 16 soaps because 6 doesnt divide into 94 exactly.

94 / 1000

16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$\begin{aligned} t &= x & s &= y \\ 6x + 4y &= 94 \\ 6x + 10y &= 20 \end{aligned}$$

B. How many packages of towels does John buy?

7 packages of towels

16. **Continued.** Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

Because then you would go  
over \$94 dollars



16. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$\$6t + \$4s = \$94$$

$$t + s = 20 \text{ packages}$$

B. How many packages of towels does John buy?

$$\$6t + \$4s = \$94$$

10 packages of towels

$$t + s = 20 \text{ packages}$$

$$10 + 10 = 20$$

$$\$6 \cdot 10 + \$4 \cdot 10 = \$94$$

$$\$60 + \$40 = \$94$$

16. **Continued.** Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

It would not be possible because each package comes with ten bars of soap so if you buy two packages you get 20 bars of soap not 16 bars.

- A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$\begin{aligned} 6t + 48 &= 94 \\ t + 8 &= 20 \end{aligned}$$

$$x = +0$$

- B. How many packages of towels does John buy?**

6  $7 + 25 = 32$

~~$X + S = 20 - 4$~~

$$-4x + -4y = -80$$

$$\begin{array}{r} + \\ 2\bar{k} = 14 \\ \hline 2 \end{array}$$

16. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

It is not  
possible for  
John to buy 16  
bars of soap  
+ 10 because  
The soap  
comes in  
packs  
of 10.

Subject: Algebra 1

Item: John Buys Supplies

Name \_\_\_\_\_

Number	Score	Notes
T2-1		
T2-2		
T2-3		
T2-4		
T2-5		
T2-6		
T2-7		
T2-8		
T2-9		
T2-10		

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# Keystone Algebra 1

## *John Buys Supplies*

### Handscoring Practice Set\*

\*Responses in this set do not have true scores. Apply scores based on scoring criteria.

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27. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains ~~8~~ towels. He also buys  $s$  packages of soap; each package is \$4 and contains ~~10 bars of soap~~. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$\begin{aligned} 94 &= 6t + 4s \\ 20 &= t + s \end{aligned}$$

B. How many packages of towels does John buy?

John buys 7 packages of towels

27. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

John can not buy exactly 16 bars of soap because each package has 10 bars of soap in it and 16 is not a multiple of 10.

27. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$\overset{20 \text{ packages}}{t+s} = 20 \quad (t \cdot 6) + (s \cdot 4) = 94$$

$6(t)$  for  $(t \cdot 6)$  towels brought  
 $4(s)$  for  $(s \cdot 4)$  soap

B. How many packages of towels does John buy?

$$\$6 = 1 \text{ pack} = 8 \text{ towel}$$

$$8(t) = 20 \leftarrow 2.5 \text{ towel packages}$$

2.5 towel packages

27. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

It would not be possible for John to buy exactly 16 bars of soap, due to the fact that he only brought 20 cleaning supplies all together, and

27. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

- A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$6t + 4s = 94$$

$$t + s = 20$$

- B. How many packages of towels does John buy?

$$\begin{array}{r} 6t + 4s = 94 \\ t + s = 20 \quad \times -4 \quad -4t - 4s = -80 \\ \hline 2t = 6 \\ \hline 2 \end{array}$$

$$t = 3$$

3 Packages of towels

27. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

Each package has  
10 bars in it, so  
one package will be  
less than 16 but two  
packages will be greater.

$$t < 16 < 2t$$

27. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$t + s = 20$$

$$6t + 4s = 94$$

B. How many packages of towels does John buy?

$$\begin{array}{r} 15.6 \\ 6 \overline{) 94.4} \\ \underline{6} \phantom{4} \\ 34 \\ \underline{30} \\ 40 \end{array}$$

15

27. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

*because the packages come in sixes*



27. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$94 = (t \cdot 6) + (s \cdot 4)$$

$$20 = t + s$$

B. How many packages of towels does John buy?

John buys a total of  
7 packages of towels.

27. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

It is not possible to buy exactly 16 bars of soap, as they come in packages of 10. You can't split a package, you have to buy everything in it.

27. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$t + s = 20$$

$$6t + 4s = 94$$

B. How many packages of towels does John buy?

$$4t + 4s = 80$$

$$6t + 4s = 94$$

$$2t = 16$$

$$t = 8$$

8 packages of towels.

27. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

Each box contains 10 and you can't buy a box with 6 in it. He should just get 20 bars, which is two boxes if he needs 16.

27. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$t + s = 18$$

$$6t + 4s = 94$$

$t \rightarrow$  towels

$s \rightarrow$  soap

B. How many packages of towels does John buy?

John buys 11 packages of towels

27. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

This would not be possible because John already bought 11 packages of towels and He would only need to buy 7 soap bars. He would not need 16 because  $11 + 16$  is not 18 it's 27. He only wants to have a total of 17 bars of soap including the 11 packages of towels.

27. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

- A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$\begin{aligned} \$94 &= 8t + 6s \\ \$94 &= 10s + 4t \end{aligned} \quad \left. \begin{array}{l} \\ \end{array} \right\} \begin{array}{l} 4 \text{ } 11.5 \\ 20 \text{ packages} \\ \text{all together} \end{array}$$

- B. How many packages of towels does John buy?

$$\begin{aligned} 94 &= \boxed{8t} + \cancel{6s} \\ -6 & \quad \quad \quad \cancel{-6} \\ \hline 88 &= \cancel{8t} \\ \underline{8} & \quad \quad \quad \cancel{8} \\ 11 &= t \end{aligned} \quad \begin{array}{l} 11 \text{ packages} \end{array}$$

27. *Continued.* Please refer to the previous page for task explanation.

C: Explain why it would not be possible for John to buy exactly 16 bars of soap.

Because he has only \$94 that  
add up to 20 packages of  
Soap packages & 11 towel  
packages.



27. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

A. Write a system of two equations to represent the packages of cleaning supplies John buys.

$$\begin{aligned}x + y &= 20 \\ 6x + 4y &= 94\end{aligned}$$

$$\begin{aligned}\text{towels} &= x \\ \text{soap} &= y\end{aligned}$$

B. How many packages of towels does John buy?

$$\begin{aligned}-6x - 6y &= -120 \\ 6x + 4y &= 94\end{aligned}$$

$$-2y = -26$$

$$y = 13$$

$$x + 13 = 20$$

$$x = 7$$

7 packages

27. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

It is because the soap only  
comes in <sup>multiples</sup> ~~factors~~ of 10 and  
16 <sup>is</sup> ~~does~~ not a multiple of  
ten.

27. John spends \$94 to buy packages of cleaning supplies for a camp. He buys  $t$  packages of towels; each package is \$6 and contains 8 towels. He also buys  $s$  packages of soap; each package is \$4 and contains 10 bars of soap. John buys 20 packages of cleaning supplies altogether.

- A. Write a system of two equations to represent the packages of cleaning supplies John buys.

equation =

$$6t + 4s = 94$$

$$8t + 10s = 20$$

$t$  = towels

$s$  = bars of soap

$$\begin{array}{r} 416 \\ \div \end{array}$$

$$\begin{array}{r} 630 \\ 214 \end{array}$$

$$6(8 + 10s - 20) = 94$$

$$48 + 630 - 120 + 12s = 94$$

$\therefore$

- B. How many packages of towels does John buy?

$$S (6t + 4s = 94) \quad 6(8) + 4s = 94$$

$$2 (8t + 10s = 20) \quad 48 + 4s = 94$$

$$-30 + -20s = -470$$

$$16 + +20s = 20$$

$$14 = -\frac{470}{20}$$

8 packs  
of towels

27. *Continued.* Please refer to the previous page for task explanation.

C. Explain why it would not be possible for John to buy exactly 16 bars of soap.

It would not be possible because he bought 8 packs of towels already. 8 packs of towels is 48 dollars because each pack of towels is 6 dollars. 16 bars of soap would equal 64 dollars.  $64 + 48 = 112$ . 112 is over his budget which his budget is 94 dollars.

**PRACTICE SET\***

**Subject: Algebra 1**

**Item: John Buys Supplies**

Name \_\_\_\_\_

Number	Score	Consensus	Notes
P-1			
P-2			
P-3			
P-4			
P-5			
P-6			
P-7			
P-8			
P-9			
P-10			

\* Responses in this set do not have true scores. Apply scores based on scoring criteria.

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# Keystone Algebra 1

*John Buys Supplies*

Handscoring  
Training Sets 1 and 2  
True Scores/Annotations

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Page	Score	Description
1	3	A. 1 point – one correct equation, $6t + 4s = 94$ . B. 1 point – correct answer. C. 1 point – complete explanation.
2	0	Nothing is correct for credit in any part. To receive “error carried through” credit in part B, part A must be a system of equations with two variables in each equation.
3	1	A. 1 point – one correct equation, $6t + 4s = 94$ . B. 0 points – incorrect answer. C. 0 points – incorrect explanation.
4	4	A. 2 points – two correct equations. B. 1 point – correct answer. C. 1 point – complete explanation.
5	3	A. 1 point – one correct equation, $t + s = 20$ . B. 1 point – correct answer. C. 1 point – complete explanation.
6	2	A. 0 points – two incorrect equations. B. 1 point – correct answer. C. 1 point – complete explanation.
7	1	A. 1 point – one correct equation, $6t + 4s = 94$ . B. 0 points – incorrect answer. C. 0 points – incorrect explanation.
8	3	A. 1 points – one correct equation, $t = 20 - s$ . “\$96” is considered incorrect, not a copy error. B. 1 point – correct answer, based on “error carried through” from part A. C. 1 point – complete explanation.
9	0	Nothing is correct for credit in any part.
10	4	A. 2 points – two correct equations. B. 1 point – correct answer. C. 1 point – complete explanation.

Page	Score	Description
1	1	A. 0 points – two incorrect equations. B. 0 points – incorrect answer (to receive “error carried through” credit in part B, part A must be a system of equations with two variables in each equation). C. 1 point – complete explanation.
2	2	A. 1 point – one correct equation. B. 1 point – correct answer . C. 0 points – incorrect explanation.
3	3	A. 1 point – one correct equation, $t + s = 20$ . B. 1 point –correct answer. C. 1 point – complete explanation.
4	2	A. 0 points – two incorrect equations. B. 1 point – correct answer. C. 1 point – complete explanation.
5	4	A. 2 points – two correct equations. B. 1 point – correct answer. C. 1 point – complete explanation.
6	3	A. 1 point – one correct equation, $6t + 4s = 94$ . B. 1 point – correct answer. C. 1 point – complete explanation.
7	0	Nothing is correct for credit in any part. To receive “error carried through” credit in part B, part A must be a system of equations with two variables in each equation.
8	2	A. 1 point – one correct equation, $6x + 4y = 94$ (x and y are both defined). No credit if they were not. B. 1 point – correct answer. C. 0 points – incorrect explanation.
9	3	A. 2 points – two correct equations. B. 0 points – incorrect answer. C. 1 point – complete explanation.
10	4	A. 2 points – two correct equations. B. 1 point – correct answer. C. 1 point – complete explanation.