## SECURE MATERIAL - Reader Name:

$\qquad$
Tennessee Comprehensive Assessment Program

## TCAP/CRA

## 2014



## Phase III

## Subtraction Equations Task Anchor Set

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## Part 2: Constructed Response Task Section

## Subtraction Equations Task

These two equations can be used to solve for the same unknown number.

$$
23-8=\square \quad 8+\square=23
$$

a. Explain how to solve for the unknown number in the first equation. Explain a different way to solve for the unknown number in the second equation.
$\square$
$\square$

$$
8+\square=23
$$

## Part 2: Constructed Response Task Section

## Subtraction Equations Task

b. Write addition equations that can be used to solve the subtraction equations below. Then solve the subtraction equations.


## Scoring Guide

## The CCSS for Mathematical Content (1 point)

2.NBT.B. 7 Solves at least 3 subtraction equations correctly in part b.
(1 Point)

## The CCSS for Mathematical Practice (3 points)

MP3 Explains two different ways to solve the related equations. Student may do this by:

- explaining that you can subtract 8 from 23 ;
- explaining that you can find the number that makes 23 when added to 8 ;
- explaining that you can count back from 23 to 8 ; or
- explaining that you can count on from 8 until you get to 23 .
(1 Point)
(MP3: Construct viable arguments and critique the reasoning of others.)
MP7 Uses the structure of the part-part-whole relationship by writing addition equations that relate to the subtraction equations in part b. At least one equation must show the structure, and no equations should show incorrect structure.
Note: All written addition equations must reflect the related subtraction equations. If calculation errors exist in the subtraction equation, the error should also be reflected in the addition equation.
(1 Point)
(MP7: Look for and make use of structure.)
MP8 Writes appropriate addition equations for each subtraction equation in part $b$.
Note: Calculation errors in subtraction equation may or may not be carried over to the addition equation.
(1 Point)
(MP8: Look for and express regularity in repeated reasoning.)


## The CCSS for Mathematical Content Addressed In This Task

## Use place value understanding and properties of operations to add and subtract.

2.NBT.B. 7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

## The CCSS for Mathematical Practice*

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

* Gray type indicates Mathematical Practices not addressed in this assessment.

Subtraction Equations Task
These two equations can be used to solve for the same unknown number.

$$
23-8=\square \quad 8+\square=23
$$

a. Explain how to solve for the unknown number in the first equation. Explain a different way to solve for the unknown number in the second equation.



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## Subtraction Equations Task

b. Write addition equations that can be used to solve the subtraction equations below. Then solve the subtraction equations.


## Total Content Points: 1

(2.NBT.B.7)

Total Practice Points: 3 (MP3, MP7, MP8)
The student solves all four subtraction equations correctly in Part B (2.NBT.B.7). The student explains two different ways to solve the related equations in Part A. The student successfully explains how to solve $23-8=$ $\qquad$ by showing all of the integers from 9 to 23 and stating "I started with eight then I went up to 23 "; the student also successfully explains how to solve $8+\ldots=23$ by stating "I subtracted $23-8$ and got 15 " (MP3). in Part B, the student uses the structure of the part-part-whole relationship to write addition equations that relate to the subtraction equations; the student writes four addition equations, all four of which show correct structure $(27+20=47,65+5=70,97+148=245,124+303=427)($ MP7 $)$. The student writes addition equations for each subtraction equation in Part $B(27+20=47,65+5=70$, $97+148=245,124+303=427$ ) (MP8).

Total Awarded Points: 4 out of 4

Subtraction Equations Task
These two equations can be used to solve for the same unknown number.

$$
23-8=\square=8+\square=23
$$

a. Explain how to solve for the unknown number in the first equation. Explain a different way to solve for the unknown number in the second equation.



## Subtraction Equations Task

b. Write addition equations that can be used to solve the subtraction equations below. Then solve the subtraction equations.

$$
\begin{aligned}
& 47-20=27 \quad 27+20=47 \\
& 65=70-5 \quad 65+5=70 \\
& 148=245-97 \quad 148+97=245 \\
& 427-124=303 \quad 303+124=427
\end{aligned}
$$

Anchor 2
Total Content Points: 1
Total Practice Points: 2 (MP7, MP8)

The student solves all four subtraction equations correctly in Part B (2.NBT.B.7). The student does not completely explain two different ways to solve the related equations in Part A . The student successfully explains how to solve $23-8=\ldots$ (" 23 is the total, and if you take 8 off, you'll get 15 "), but the explanation for $8+\ldots=23$ is incomplete because it does not indicate counting up until reaching 23 ("If you have 8 , you can count up and you'll have 15 ") (no credit for MP3). In Part B, the student uses the structure of the part-part-whole relationship to write addition equations that relate to the subtraction equations. The student writes four addition equations, all four of which appropriately relate to the subtraction equations $(27+20=47$, $65+5=70,148+97=245,303+124=427)($ MP7 $)$. The student writes addition equations for each subtraction equation in Part $B(27+20=47,65+5=70,148+97=245,303+124=427)$ (MP8).

Total Awarded Points: 3 out of 4

Subtraction Equations Task
These two equations can be used to solve for the same unknown number.

$$
23-8=\square \quad 8+\square=23
$$

a. Explain how to solve for the unknown number in the first equation. Explain a different way to solve for the unknown number in the second equation.

$$
23-8=15
$$

youcan use addition for this prorbem, $b_{\text {cause: }} 8+15=23$ so this promblem is almost the same as that one. (fact family)

$$
8+15=23
$$

You can use subtraction because.'2. $23-8=15$ so you can use subtraction forthispromblem.

$$
\begin{array}{r}
1 \\
-\quad 13 \\
\hline-8 \\
\hline 15
\end{array}
$$

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Subtraction Equations Task
b. Write addition equation that can be used to solve the subtraction equations below. Then solve the subtraction equations.


Litho\#: 00712200169
Page 12 of 34

Total Content Points: 1
(2.NBT.B.7)

Total Practice Points: 2 (MP7, MP8)
The student solves three subtraction equations correctly in Part B, finding the answers of 20, 148, and 303) (2.NBT.B.7). The student does not explain two different ways to solve the related equations in Part A. The student does successfully explain how to solve $8+$ $\qquad$ $=23$ ("You can use subtraction because $23-8=15$ so you can use subtraction for this promblem"), but for the first part of Part A, $23-8$, simply inserting the unknown number in an addition equation ("because $8+15=23$ so this problem is almost the same as that one") does not explain how the unknown number can be found (no credit for MP3). In Part B, the student uses the structure of the part-part-whole relationship to write addition equations that relate to the subtraction equations. The student writes four addition equations, all four of which represent the given subtraction equations. One subtraction equation has a calculation error, which is reflected in the addition equation ( $65=70-15,65+15=70$ ) (MP7). The student writes addition equations for each subtraction equation in Part $B(20+27=47,65+15=70,97+148=245,303+124=$ 427); the calculation error in the subtraction equation is carried over to the addition equation (65 = $70-15,65+15=70$ ) (MP8).

Total Awarded Points: 3 out of 4

## Subtraction Equations Task

These two equations can be used to solve for the same unknown number.

$$
23-8=\square \quad 8+\square=23
$$

a. Explain how to solve for the unknown number in the first equation.

Explain a different way to solve for the unknown number in the second equation.



Subtraction Equations Task
b. Write addition equations that can be used to solve the subtraction equations below. Then solve the subtraction equations.


Anchor 4
Total Content Points: 1
Total Practice Points: 1

The student accurately solves three of the four subtraction equations in Part B (2.NBT.B.7). The student explains two different ways to solve the related equations in Part A. The student successfully explains how to solve $23-8=\ldots$ ("Well if you count up on your fingers from 8 to 23 you get $15 "$ ) and $8+$ $\qquad$ $=23$ ("If you do $23-8$ you will get 15 ") (MP3). In Part B, the student does not consistently use the structure of the part-part-whole relationship to write addition equations that relate to the subtraction equations. The student writes four addition equations, but one pair of equations shows an incorrect structure that indicates adding and subtracting the numbers results in the same answer ( $342=245-97,245+97=342$ ) (no credit for MP7). The student writes addition equations for each subtraction equation in Part B, but one equation uses the wrong addends, which results in an incorrect equation for the subtraction equation $(245+97=342)$ (no credit for MP8).

Total Awarded Points: 2 out of 4

Subtraction Equations Task
These two equations can be used to solve for the same unknown number.

$$
23-8=\square=23
$$

a. Explain how to solve for the unknown number in the first equation. Explain a different way to solve for the unknown number in the second equation.


## Subtraction Equations Task

b. Write addition equations that can be used to solve the subtraction equations below. Then solve the subtraction equations.


## Anchor 5

Total Content Points: 1
Total Practice Points: 1

The student solves three of the four subtraction equations correctly in Part B (2.NBT.B.7). In Part A, while the student successfully explains how to find the missing addend in $8+$ $\qquad$ $=23$ ("All you have to do. 'Is to Keep on adding to 81 at a time, and add untill you get to 23 '"), the student does not explain how to solve for the unknown number in the equation $23-8=$ $\qquad$ . Instead, the student simply reorients the horizontal equation to become a vertical expression ("All you have to do is put every than verdalicky [everything vertical] like this: solve it") (no credit for MP3). In Part B, the student writes four addition equations, but one subtraction equation shows a calculation error that is not reflected in the related addition equation $(145=245-97,97+148=245)$ (no credit for MP7). The student writes addition equations for each subtraction equation in Part B $(27+20=47,65+5=70,97+148=245$, $124+303=427$ ) (MP8).

Total Awarded Points: 2 out of 4

Subtraction Equations Task
These two equations can be used to solve for the same unknown number.

$$
23-8=15
$$

$$
8+15=23
$$

a. Explain how to solve for the unknown number in the first equation. Explain a different way to solve for the unknown number in the second equation.
Dust subtract $=8$ - from
23 . and you get 15
8+ $15=23$
also Just
Count up or do the same
thing. . like subtract 8
from 23.

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## Subtraction Equations Task

b. Write addition equations that can be used to solve the subtraction equations below. Then solve the subtraction equations.


## Total Content Points: 0

Total Practice Points: 2 (MP7, MP8)
The student only solves two of the four subtraction equations correctly in Part B (no credit for 2.NBT.B.7). In Part A, the student successfully explains how to solve for the missing number in $23-8=\ldots$ ("Just subtract 8 from 23. and you get 15 ") but the explanation for $8+\ldots=23$ does not refer to 23 as the endpoint for counting up ("also Just count up"), and also repeats the method given for solving the first equation (no credit for MP3). In Part B, the student writes four addition equations, all four of which relate to the subtraction equations given, including reflecting calculation errors present in two of the subtraction equations ( $65+4=70$, $323+124=427)($ MP7 $)$. The student writes addition equations for each subtraction equation in Part B $(27+20=47,65+4=70,148+97=245,323+124=427)$; the calculation errors in the subtraction equations are carried over to the addition equations (MP8).

Total Awarded Points: 2 out of 4

## Subtraction Equations Task

These two equations can be used to solve for the same unknown number.

$$
23-8=15 \quad 8+15=23
$$

a. Explain how to solve for the unknown number in the first equation.

Explain a different way to solve for the unknown number in the second equation.


Subtraction Equations Task
b. Write addition equations that can be used to solve the subtraction equations below. Then solve the subtraction equations.


## Anchor 7

## Total Content Points: 1

Total Practice Points: 0
The student solves all four subtraction equations correctly in Part B (2.NBT.B.7). In Part A, the student does not explain how to find the missing number from the missing-addend addition equation. The student just inserts the number to be found to show that $8+15=23$ (" $8+15=23$ eigh plus fiveteen will get me to 23 ") (no credit for MP3). In Part B, the student writes four addition equations, but one shows incorrect structure by not adding the correct addends to get the sum shown in the subtraction equation ( $65=70-5,5+70=65$ ) (no credit for MP7). The student writes addition equations for each subtraction equation in Part $B$, but one equation uses the wrong addends, which results in an incorrect addition equation for the related subtraction equation ( $65=70-5,5+70=65$ ) (no credit for MP8).

Total Awarded Points: 1 out of 4

Subtraction Equations Task
These two equations can be used to solve for the same unknown number.

$$
23-8=\square \quad 8+\square=23
$$

a. Explain how to solve for the unknown number in the first equation. Explain a different way to solve for the unknown number in the second equation.



## Subtraction Equations Task

b. Write addition equations that can be used to solve the subtraction equations below. Then solve the subtraction equations.


## Total Content Points: 1

Total Practice Points: 0
The student solves all four subtraction equations correctly in Part B. Although the student does not write the missing number from the fourth equation in the box, the equation is clearly shown, including the missing number, to the right of the box; therefore, the student has clearly solved the fourth subtraction equation (2.NBT.B.7). The student does not explain two different ways to solve the related equations in Part A; the student explains how to solve $23-8=$ $\qquad$ ("You take away 8 from 23 and you get 15 ") and uses a similar explanation to solve $8+\ldots=23$ ("You do the same as $23-8$ and it will be the same answer") (no credit for MP3). The student incorrectly uses the structure of the part-part-whole relationship to write addition equations that relate to the subtraction equations in Part B. The student writes one addition equation that, by not adding the correct addends to get the sum shown in the subtraction equation ( $65=70-5,5+70=65$ ), shows incorrect structure (no credit for MP7). The student does not write addition equations for each subtraction equation in Part B (no credit for MP8).

Total Awarded Points: 1 out of 4

Subtraction Equations Task
These two equations can be used to solve for the same unknown number.

$$
23-8=5 \quad 8+\boxed{5} \quad=23
$$

a. Explain how to solve for the unknown number in the first equation. Explain a different way to solve for the unknown number in the second equation.


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## Subtraction Equations Task

b. Write addition equations that can be used to solve the subtraction equations below. Then solve the subtraction equations.


## Total Content Points: 1

(2.NBT.B.7)

Total Practice Points: 0
The student solves three of the four subtraction equations correctly in Part B (2.NBT.B.7). The student does not completely explain two different ways to solve the related equations in Part A. The student writes incomplete explanations on how to solve $23-8=\ldots$ ("I Just count down") and $8+\ldots=23$ ("I Just count up"). Both explanations are incomplete because they do not specify a starting point or an ending point for counting (no credit for MP3). The student incorrectly uses the structure of the part-part-whole relationship to write addition equations that relate to the subtraction equations in Part B. Although the part-part-whole models the student shows for the first three equations indicate some understanding of the structure of subtraction, the student writes three addition equations, all of which simply add the two known numbers from the subtraction equations (no credit for MP7). The student does not write related addition equations for the subtraction equations in Part B (no credit for MP8).

Total Awarded Points: 1 out of 4

Subtraction Equations Task
These two equations can be used to solve for the same unknown number.

$$
23-8=\square=8+\square=23
$$

a. Explain how to solve for the unknown number in the first equation. Explain a different way to solve for the unknown number in the second equation.


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## Subtraction Equations Task

b. Write addition equations that can be used to solve the subtraction equations below. Then solve the subtraction equations.

$427-124=550 \quad 427+129=551$


## Total Content Points: 0

Total Practice Points: 0
The student only solves one subtraction equation correctly in Part B (no credit for 2.NBT.B.7). The student does not explain two different ways to solve the related equations in Part A. The student successfully explains how to solve $23-8=\ldots$ ("Just take away 8 from 23"), but the explanation for $8+\ldots=23$ is insufficient ("Just add 15 to 8 and you get 23 ") (no credit for MP3). The student writes four addition equations in Part B, but three show incorrect structure $(70+35=65,97+245=97,427+124=551)($ no credit for MP7 $)$. The student writes addition equations for each subtraction equation in Part $B$, but three equations use the wrong addends, which results in incorrect equations $(70+35=65,97+245=97,427+124=551)$ (no credit for MP8).

Total Awarded Points: 0 out of 4

