

SECURE MATERIAL – Reader Name: _____
Tennessee Comprehensive Assessment Program

TCAP/CRA

2014



6

Phase III

Mowing the Lawn Task

Anchor Set

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Mowing the Lawn Task


John makes \$20 for each lawn (m) he mows. He is saving money to buy a scooter that costs \$180.

- a. John wants to determine how many lawns he needs to mow to reach his goal. He writes two different expressions to help.

Expression A: $180m - 20$

Expression B: $180 - 20m$

Which expression should John use? Explain your reasoning.



A large rectangular box for writing the answer to part (a). In the top-left corner, there is a small icon of a hand holding a pencil.

- b. John's mother tells him that $20(9m - 1)$ is equivalent to Expression A above. Determine if John's mother is correct and support your answer.



A large rectangular box for writing the answer to part (b). In the top-left corner, there is a small icon of a hand holding a pencil.

- c. John decides that he only wants to cut 25 lawns all summer. He needs to make *more than* \$360 to pay for the new scooter, new sneakers, and school supplies. He uses the inequality $360 < 25c$ and gets an answer of $14.4 < c$ after solving it. Explain how John arrived at that answer and explain what that answer means in the context of the problem.



Scoring Guide

The CCSS for Mathematical Content (3 points)

- 6.EE.B.6 Identifies $180 - 20m$ (Expression B) as the correct expression in part a. _____
(1 Point)
- 6.EE.A.4 Determines that the expression provided in part b is equivalent to Expression A. _____
(1 Point)
- 6.EE.B.5 Identifies that if 14.4 is multiplied by 25, the product is 360, or that 360 divided by 25 is 14.4. States that John needs to charge *more than* \$14.40 in order to make more than the desired \$360. _____
(1 Point)

The CCSS for Mathematical Practice (2 points)

- MP3 Justifies the choice of expression in part a using appropriate mathematical language. _____
(1 Point)
(MP3: Construct viable arguments and critique the reasoning of others.)
- MP7 Supports the answer for part b by using the distributive property or substituting the same value in both equations and evaluating them. _____
(1 Point)
(MP7: Look for and make use of structure.)

TOTAL POINTS: 5

The CCSS for Mathematical Content Addressed In This Task

Apply and extend previous understandings of arithmetic to algebraic expressions.	
6.EE.A.4	Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). <i>For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.</i>
Reason about and solve one-variable equations and inequalities.	
6.EE.B.5	Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
6.EE.B.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

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.

Mowing the Lawn Task


John makes \$20 for each lawn (m) he mows. He is saving money to buy a scooter that costs \$180.

- a. John wants to determine how many lawns he needs to mow to reach his goal. He writes two different expressions to help.


Expression A: $180m - 20$

Expression B: $180 - 20m$

Which expression should John use? Explain your reasoning.

 He should use expression B because you aren't getting \$180. For every lawn, you are getting \$20 so you would multiply the number of lawns times \$20.

- b. John's mother tells him that $20(9m - 1)$ is equivalent to Expression A above. Determine if John's mother is correct and support your answer.

 She is correct. Let's say John mows 9 lawns. If you plug in 9 for m in both expressions, they equal 1,600.


$$180(9) - 20 = 1,620 - 20 = 1,600$$

$$20(9 \cdot 9 - 1) = 20(80) = 1,600$$

$$20 \cdot 80 = 1,600$$

Mowing the Lawn Task

- c. John decides that he only wants to cut 25 lawns all summer. He needs to make *at least* \$360 to pay for the new scooter, new sneakers, and school supplies. He uses the inequality $360 < 25c$ and gets an answer of 14.4 after solving it. Explain how John arrived at that answer and explain what that answer means in the context of the problem.

 He solved it like this:

$$\begin{array}{r} 360 < 25c \\ \underline{25} \quad \underline{25} \\ 14.4 < c \end{array}$$

It means he must make more than \$14.40 for each lawn he mows to have over \$360

Anchor 1 Litho 00126200165

Total Content Points: 3 (6.EE.B.6, 6.EE.A.4, 6.EE.B.5)

Total Practice Points: 2 (MP3, MP7)

The student identifies Expression B as the correct expression in Part A (6.NS.C.6c), and justifies the choice by contrasting the coefficients in the two given expressions as they relate to the variable m (“ you aren’t getting \$180 for every lawn . . . you would multiply the number of lawns times \$20”) (MP3). The student determines that the expression provided in Part B is equivalent to Expression A (“She is correct”) (6.EE.A.4), and supports the answer by substituting the same value (9) in both equations and evaluating them to find the same answer (1,600) (MP7). In Part C, the student identifies that 360 divided by 25 is 14.4, and states that John needs to make more than \$14.40 for each lawn he mows to earn \$360 (6.EE.B.5).

Total Awarded Points: 5 out of 5

Mowing the Lawn Task


John makes \$20 for each lawn (m) he mows. He is saving money to buy a scooter that costs \$180.

- a. John wants to determine how many lawns he needs to mow to reach his goal. He writes two different expressions to help.


Expression A: $180m - 20$

Expression B: $180 - 20m$

Which expression should John use? Explain your reasoning.

 John should use expression B because for every lawn he mows he gets \$20. For each time he mows a lawn, he adds 20 dollars to his total amount. When he gets 180 dollars, he is ready to buy his scooter.

- b. John's mother tells him that $20(9m - 1)$ is equivalent to Expression A above. Determine if John's mother is correct and support your answer.


 Yes - John's mother is correct because both expressions are equivalent. Say, for example, that he mows 6 lawns. Insert 6 into the m variables. You would then get

$180 \cdot 6 - 20$	$20(9 \cdot 6 - 1)$
$1080 - 20$	$20(54 - 1)$
1060	$20 \cdot 53$
	1060

Both are equal

Mowing the Lawn Task

- c. John decides that he only wants to cut 25 lawns all summer. He needs to make *at least* \$360 to pay for the new scooter, new sneakers, and school supplies. He uses the inequality $360 < 25c$ and gets an answer of 14.4 after solving it. Explain how John arrived at that answer and explain what that answer means in the context of the problem.

 John arrived at this answer by dividing 360 by 25. In the context, it says 360 is less than 25 multiplied by c. There is nothing hinted saying that he needs to divide, he should've replaced c with 209 because he makes that amount per lawn mowed, using this equation, he would've made much more than \$360.

Anchor 2 Litho 00436200165

Total Content Points: 2 (6.EE.B.6, 6.EE.A.4)

Total Practice Points: 2 (MP3, MP7)

The student identifies Expression B as the correct expression in Part A (6.NS.C.6c), and justifies the choice by associating the variable m to the twenty dollars and also explaining the meaning of the \$180 (“each time he mows a lawn, he adds 20 dollars to his total amount. When he gets 180 dollars, he is ready to buy his scooter”) (MP3). The student determines that the expression provided in Part B is equivalent to Expression A (6.EE.A.4), and supports the answer by substituting the same value (6) in both equations and evaluating them to find the same answer (1060) (MP7). In Part C, although the student identifies that 360 divided by 25 is 14.4, there is no statement that John needs to charge more than \$14.40 in order to make over \$360 (no credit for 6.EE.B.5).

Total Awarded Points: 4 out of 5

Mowing the Lawn Task


John makes \$20 for each lawn (m) he mows. He is saving money to buy a scooter that costs \$180.

- a. John wants to determine how many lawns he needs to mow to reach his goal. He writes two different expressions to help.

Expression A: $180m - 20$

Expression B: $180 - 20m$


Which expression should John use? Explain your reasoning.

 Expression B because it tells him how much more money he needs for his scooter. So if he mowed two lawns

Ex!

$$180 - 20(2) = 140$$

- b. John's mother tells him that $20(9m - 1)$ is equivalent to Expression A above. Determine if John's mother is correct and support your answer.

 She is correct if you use $two = m$ then you would get identical answers.

$$20(9(2) - 1) = 340$$

$$180(2) - 20 = 340$$

Mowing the Lawn Task

- c. John decides that he only wants to cut 25 lawns all summer. He needs to make at least \$360 to pay for the new scooter, new sneakers, and school supplies. He uses the inequality $360 < 25c$ and gets an answer of 14.4 after solving it. Explain how John arrived at that answer and explain what that answer means in the context of the problem.



Since he wants to only mow 25 lawns, his equation is correct. For his left side of the equation he used how much money he needs. On the right side it's the lawns he is going to mow and the cash he will make (20\$ each lawn), so he will have 500 by the end of summer and have enough money.

Anchor 3 Litho 00076200165

Total Content Points: 2 (6.EE.B.6, 6.EE.A.4)

Total Practice Points: 2 (MP3, MP7)

The student identifies Expression B as the correct expression in Part A (6.NS.C.6c), and justifies the choice by indicating that the value of its solution is the amount of money still needed (“tells him how much more money he needs”) and providing an illustrative example (“if he moved two lawns EX: $180 - 20(2) = 140\$$ ”) (MP3). The student determines that the expression provided in Part B is equivalent to Expression A (“She is correct”) (6.EE.A.4), and supports the answer by substituting the same value (2) in both equations and evaluating them to find the same answer (340) (MP7). In Part C, the student neither identifies how 14.4 was determined as the solution to the equation nor explains the meaning of the 14.4 in the context of the problem (no credit for 6.EE.B.5).

Total Awarded Points: 4 out of 5

Mowing the Lawn Task


John makes \$20 for each lawn (m) he mows. He is saving money to buy a scooter that costs \$180.

- a. John wants to determine how many lawns he needs to mow to reach his goal. He writes two different expressions to help.


Expression A: $180m - 20$

Expression B: $180 - 20m$

Which expression should John use? Explain your reasoning.


 Expression B because m is how many lawns John mowed. If you multiply the amount of money for each lawn (\$20) by the amount of lawns mowed, (m) you will get the total amount of money.

- b. John's mother tells him that $20(9m - 1)$ is equivalent to Expression A above. Determine if John's mother is correct and support your answer.

 Yes because I used 2 to replace the m , and followed the order of operations to get the same answer for both expressions

Mowing the Lawn Task

- c. John decides that he only wants to cut 25 lawns all summer. He needs to make *at least* \$360 to pay for the new scooter, new sneakers, and school supplies. He uses the inequality $360 < 25c$ and gets an answer of 14.4 after solving it. Explain how John arrived at that answer and explain what that answer means in the context of the problem.

 John divided 25 by both sides and the $25c$ canceled out and 360 divided by 25 is 14.4. It means that John needs to mow 14.4 lawns in order to get \$360.

Anchor 4 Litho 00706200165

Total Content Points: 2 (6.EE.B.6, 6.EE.A.4)

Total Practice Points: 1 (MP3)

The student identifies Expression B as the correct expression in Part A (6.NS.C.6c), and justifies the choice by correctly associating the amount earned per lawn with the number of lawns mowed (“multiply the amount of money for each lawn (\$20) by the amount of lawns mowed, (m)”) (MP3). The student determines that the expression provided in Part B is equivalent to Expression A (6.EE.A.4), but does not sufficiently support the answer by failing to illustrate the process of substituting the same value in both equations and evaluating them (no credit for MP7). In Part C, although the student identifies that 360 divided by 25 is 14.4, there is no statement that John needs to charge more than \$14.40 in order to make over \$360 (no credit for 6.EE.B.5).

Total Awarded Points: 3 out of 5

Mowing the Lawn Task


John makes \$20 for each lawn (m) he mows. He is saving money to buy a scooter that costs \$180.

- a. John wants to determine how many lawns he needs to mow to reach his goal. He writes two different expressions to help.


Expression A: $180m - 20$

Expression B: $180 - 20m$

Which expression should John use? Explain your reasoning.

 Expression B because if the expression equals 0, he'll know when he'd make his goal.

- b. John's mother tells him that $20(9m - 1)$ is equivalent to Expression A above. Determine if John's mother is correct and support your answer.


 Yes they are equivalent. $m = 2$

$$20(9 \cdot 2 - 1) = 340$$

$$180 \cdot 2 - 20 = 340$$

Mowing the Lawn Task

- c. John decides that he only wants to cut 25 lawns all summer. He needs to make *at least* \$360 to pay for the new scooter, new sneakers, and school supplies. He uses the inequality $360 < 25c$ and gets an answer of 14.4 after solving it. Explain how John arrived at that answer and explain what that answer means in the context of the problem.

 14.4 is how much money he's going to charge. However, he just divided

$$\frac{360}{25} = 14.4$$

Anchor 5 Litho 00626200165

Total Content Points: 2 (6.EE.B.6, 6.EE.A.4)

Total Practice Points: 1 (MP7)

The student identifies Expression B as the correct expression in Part A (6.NS.C.6c), but does not sufficiently justify the choice by including specific details explaining why (no credit for MP3). The student determines that the expression provided in Part B is equivalent to Expression A (6.EE.A.4), and supports the answer by substituting the same value (2) in both equations and evaluating them to find the same answer (340) (MP7). In Part C, the student identifies that 360 divided by 25 is 14.4, but does not clearly state that John needs to charge more than \$14.40 in order to make more than \$360 (“14.4 is how much money he’s going to charge”) (no credit for 6.EE.B.5).

Total Awarded Points: 3 out of 5

Mowing the Lawn Task


John makes \$20 for each lawn (m) he mows. He is saving money to buy a scooter that costs \$180.

- a. John wants to determine how many lawns he needs to mow to reach his goal. He writes two different expressions to help.


Expression A: $180m - 20$

Expression B: $180 - 20m$

Which expression should John use? Explain your reasoning.

 I would do B because
you wouldn't multiply \$20
you would multiply \$180.

- b. John's mother tells him that $20(9m - 1)$ is equivalent to Expression A above. Determine if John's mother is correct and support your answer.

 Yes, because she is
using distributive property.

Mowing the Lawn Task

- c. John decides that he only wants to cut 25 lawns all summer. He needs to make *at least* \$360 to pay for the new scooter, new sneakers, and school supplies. He uses the inequality $360 < 25c$ and gets an answer of 14.4 after solving it. Explain how John arrived at that answer and explain what that answer means in the context of the problem.

✍ His equation was wrong.
He should've multiplied
25c and then divide
that answer to 360.

Anchor 6

Litho 00526200165

Total Content Points: 2 (6.EE.B.6, 6.EE.A.4)

Total Practice Points: 0

The student identifies Expression B as the correct expression in Part A (6.NS.C.6c), and attempts to justify the choice with what appears to be an erroneous argument (“you wouldn’t multiply \$20 you would multiply \$180”) without including specific details explaining why (no credit for MP3). The student determines that the expression provided in Part B is equivalent to Expression A (6.EE.A.4), but does not sufficiently support the answer (“she is using distributive property”) by failing to illustrate the process with an example (no credit for MP7). In Part C, the student neither identifies how 14.4 was determined as the solution to the equation nor explains the meaning of the 14.4 in the context of the problem (no credit for 6.EE.B.5).

Total Awarded Points: 2 out of 5

Mowing the Lawn Task


John makes \$20 for each lawn (m) he mows. He is saving money to buy a scooter that costs \$180.

- a. John wants to determine how many lawns he needs to mow to reach his goal. He writes two different expressions to help.


Expression A: $180m - 20$

Expression B: $180 - 20m$

Which expression should John use? Explain your reasoning.


 John should use expression A, because to find how many lawns he needs to mow, you do $180 \div 20$, which equals 9.

- b. John's mother tells him that $20(9m - 1)$ is equivalent to Expression A above. Determine if John's mother is correct and support your answer.

 $20(9m - 1)$
 $180m - 20 = 180m - 20$
 Yes, John's mother is correct, because if you multiply $20 \cdot 9$, it equals 180, and if you multiply $20 \cdot 1$, it equals 20.

Mowing the Lawn Task

- c. John decides that he only wants to cut 25 lawns all summer. He needs to make *at least* \$360 to pay for the new scooter, new sneakers, and school supplies. He uses the inequality $360 < 25c$ and gets an answer of 14.4 after solving it. Explain how John arrived at that answer and explain what that answer means in the context of the problem.

 John divided 360 by 25,
and got 14.4.

This means that John should cut at least 14 lawns, to make \$360 to pay for the new scooter, new sneakers, and school supplies, that he wants to buy.

Anchor 7 Litho 00606200165

Total Content Points: 1 (6.EE.A.4)

Total Practice Points: 1 (MP7)

The student incorrectly identifies Expression A in Part A (no credit for 6.NS.C.6c), and does not justify that choice (no credit for MP3). The student determines that the expression provided in Part B is equivalent to Expression A (6.EE.A.4), and supports that answer by using the distributive property to expand $20(9m - 1)$ to $180m - 20$ and showing that it is equivalent to Expression A (MP7). In Part C, although the student identifies that 360 divided by 25 is 14.4, the meaning of the 14.4 in the context of the problem is misunderstood (“This means that John should cut at least 14 lawns”) (no credit for 6.EE.B.5).

Total Awarded Points: 2 out of 5

Mowing the Lawn Task


John makes \$20 for each lawn (m) he mows. He is saving money to buy a scooter that costs \$180.

- a. John wants to determine how many lawns he needs to mow to reach his goal. He writes two different expressions to help.


Expression A: $180m - 20$

Expression B: $180 - 20m$

Which expression should John use? Explain your reasoning.


 Expression B because in EA he is multiplying the cost of the scooter with how many lawns he mowed which would already be too many lawns so it has to be EB

- b. John's mother tells him that $20(9m - 1)$ is equivalent to Expression A above. Determine if John's mother is correct and support your answer.

 $20(9m - 1)$
 $20(8m)$
 $20 \cdot 8 = 160m$ so no she isn't correct

Mowing the Lawn Task

- c. John decides that he only wants to cut 25 lawns all summer. He needs to make *at least* \$360 to pay for the new scooter, new sneakers, and school supplies. He uses the inequality $360 < 25c$ and gets an answer of 14.4 after solving it. Explain how John arrived at that answer and explain what that answer means in the context of the problem.

 There is no way to get 14.4 because he is using the sign that compares the numbers

Anchor 8

Litho 00146200165

Total Content Points: 1 (6.EE.B.6)

Total Practice Points: 0

The student identifies Expression B as the correct expression in Part A (6.NS.C.6c), but does not sufficiently justify the choice due to unclear wording (“he is multiplying the cost of the scooter with how many lawns he mowed which would already be to many lawns”) (no credit for MP3). The student does not determine that the expression provided in Part B is equivalent to Expression A (“no she isn’t correct”) (no credit for 6.EE.A.4), and does not support the answer either by using the distributive property or by substituting the same value in both equations and evaluating them (no credit for MP7). In Part C, the student neither identifies how 14.4 was determined as the solution to the equation nor explains the meaning of the 14.4 in the context of the problem (no credit for 6.EE.B.5).

Total Awarded Points: 1 out of 5

Mowing the Lawn Task


John makes \$20 for each lawn (m) he mows. He is saving money to buy a scooter that costs \$180.

- a. John wants to determine how many lawns he needs to mow to reach his goal. He writes two different expressions to help.


Expression A: $180m - 20$

Expression B: $180 - 20m$

Which expression should John use? Explain your reasoning.


 Expression B, because it best explains how many lawns he needs to mow.

- b. John's mother tells him that $20(9m - 1)$ is equivalent to Expression A above. Determine if John's mother is correct and support your answer.

 John's mother is incorrect, because you aren't able to simplify amounts of money and still get a reasonable amount of pay.

Mowing the Lawn Task

- c. John decides that he only wants to cut 25 lawns all summer. He needs to make *at least* \$360 to pay for the new scooter, new sneakers, and school supplies. He uses the inequality $360 < 25c$ and gets an answer of 14.4 after solving it. Explain how John arrived at that answer and explain what that answer means in the context of the problem.

 $360 < 25c = 14.4$
John divided 25 into 360. The answer means that he divided 25 lawns into \$360.

Anchor 9

Litho 00186200165

Total Content Points: 1 (6.EE.B.6)

Total Practice Points: 0

The student identifies Expression B as the correct expression in Part A (6.NS.C.6c), but does not sufficiently justify the choice by including specific details explaining why (no credit for MP3). The student does not determine that the expression provided in Part B is equivalent to Expression A (“John’s mother is incorrect”) (no credit for 6.EE.A.4), and does not evaluate the equations by using the distributive property or by substituting the same value into both equations (no credit for MP7). In Part C, although the student identifies that 360 divided by 25 is 14.4, there is no statement indicating the meaning of the 14.4 in the context of the problem (no credit for 6.EE.B.5).

Total Awarded Points: 1 out of 5

Mowing the Lawn Task


John makes \$20 for each lawn (m) he mows. He is saving money to buy a scooter that costs \$180.

- a. John wants to determine how many lawns he needs to mow to reach his goal. He writes two different expressions to help:


Expression A: $180m - 20$

Expression B: $180 - 20m$

Which expression should John use? Explain your reasoning.


 Expression A:
You would multi: $180 \cdot m - 20$

- b. John's mother tells him that $20(9m - 1)$ is equivalent to Expression A above. Determine if John's mother is correct and support your answer.

 No that would be $20(9m)$

Mowing the Lawn Task

- c. John decides that he only wants to cut 25 lawns all summer. He needs to make *at least* \$360 to pay for the new scooter, new sneakers, and school supplies. He uses the inequality $360 < 25c$ and gets an answer of 14.4 after solving it. Explain how John arrived at that answer and explain what that answer means in the context of the problem.

 he divided $360 \div 25$
14.4 stands for how much
money he will get for each lawn

Anchor 10

Litho 00336200165

Total Content Points: 0

Total Practice Points: 0

The student incorrectly identifies Expression A in Part A (no credit for 6.NS.C.6c), and does not justify the choice (no credit for MP3). The student does not determine that the expression provided in Part B is equivalent to Expression A (no credit for 6.EE.A.4), and does not evaluate the equations by using the distributive property or by substituting the same value into both equations (no credit for MP7). In Part C, the student identifies that 360 divided by 25 is 14.4, but does not state that John needs to charge more than \$14.40 in order to make more than \$360 (“14.4 stands for how much money he will get for each lawn”) (no credit for 6.EE.B.5).

Total Awarded Points: 0 out of 5