

Tennessee Comprehensive Assessment Program

TCAP/CRA 2013



7

Anchor Set

Grade 7 – eReader Sales Task

SECURE MATERIAL - Reader Name: _____

Tennessee Comprehensive Assessment Program

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Constructed Response Assessment

eReader Sales Task


Andy works as a salesperson on Saturdays and Sundays at an electronics store. He is paid \$46.50 each day and, for every eReader he sells, he also earns 5% of the sale price. The store is selling eReaders this Saturday and Sunday for \$69.99.

- a. Andy wants his total earnings this weekend to be at least \$150. How many eReaders must he sell to reach his goal? Show your work and interpret your solution in the context of the problem.



A large rectangular box for writing the solution to part (a). In the top-left corner, there is a small icon of a hand holding a pen, indicating where to start writing.

- b. Andy decides he wants to earn at least \$200. Write an inequality that can be used to calculate the number of eReaders he must sell.



A large rectangular box for writing the solution to part (b). In the top-left corner, there is a small icon of a hand holding a pen, indicating where to start writing.



The CCSS for Mathematical Content Addressed In This Task

Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

7.EE.B.4b Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p , q , and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.*

Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers.

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.

Scoring Guide

The CCSS for Mathematical Content (2 points)

- 7.NS.A.3 Determines correctly the number of eReaders Andy needs to sell in any of the following ways: _____
- Writing and solving an inequality algebraically using subtraction and division;
 - Finding the difference between \$150 and his 2-day flat rate of pay and dividing that difference by 5% of the sale price of an eReader;
 - Creating a table of values showing the sum of his 2-day flat rate and his commission from different numbers of eReaders;
 - Creating a table showing the commission from different numbers of eReaders and then comparing that value against the difference between his goal and his flat rate;
 - Using multiplication and addition to guess and check Andy's earnings from selling different numbers of eReaders. **(1 Point)**
- 7.EE.B.4b Writes an inequality that can be used to find the number of eReaders Andy must sell to earn at least \$200. **(1 Point)** _____

The CCSS for Mathematical Practice (3 points)


- MP1 Completes all parts of the problem, making sense of the fact that Andy works 2 days, that his income is dependent on the number of eReaders he sells, and that the words “at least” in the problem context indicate that the value of the expression used to calculate Andy's income must be greater than or equal to \$150. **(1 Point)** _____
(MP1: Make sense of problems and persevere in solving them.)
- MP2 Interprets the solution in part a as representing the minimum number of eReaders that must be sold in order for Andy to earn at least \$150. **(1 Point)** _____
(MP2: Reason abstractly and quantitatively.)
- MP6 Performs numerical calculations correctly and uses mathematical language and/or notation with precision. **(1 Point)** _____
(MP6: Attend to precision.)

TOTAL POINTS: 5

4. eReader Sales Task

Andy works as a salesperson on Saturdays and Sundays at an electronics store. He is paid \$46.50 each day and, for every eReader he sells, he also earns 5% of the sale price. The store is selling eReaders this Saturday and Sunday for \$69.99.

- a. Andy wants his total earnings this weekend to be at least \$150. How many eReaders must he sell to reach his goal? Show your work and interpret your solution in the context of the problem.



69.99	150	46.50
$\times 0.05$	$- 93$	$\times 2$
3.4995	57	93.00

for two days


← earns 3.4995 dollars for each e-reader
 ↑ needs to make 57 dollars

$(3.4995)x \geq 57$ dollars

Andy can't sell a part of an e-reader, so he has to round up and sell 17 e-readers to make 150 dollars.

$x \geq \frac{57}{3.4995}$ dollars $x \geq 16.288$

- b. Andy decides he wants to earn at least \$200. Write an inequality that can be used to calculate the number of eReaders he must sell.



→ amount Andy gets for 2 days

$$\underline{\$200} \leq \underline{\$93} + (3.4995)x \rightarrow \# \text{ of e-readers Andy sells}$$


← amount Andy wants

↓ amount Andy gets for each e-reader he sells

eReader Sales Task

Andy works as a salesperson on Saturdays and Sundays at an electronics store. He is paid \$46.50 each day and, for every eReader he sells, he also earns 5% of the sale price. The store is selling eReaders this Saturday and Sunday for \$69.99.

- a. Andy wants his total earnings this weekend to be at least \$150. How many eReaders must he sell to reach his goal? Show your work and interpret your solution in the context of the problem.



46.50
x 2
\$ 93.00

$$150 \leq 93 + .05(69.99)(x)$$

$$150 - 93 = (.05)(69.99)x$$


$$57 = 3.5x$$

$$\frac{57}{3.5} = x$$

$$16.2857 = x$$

Andy must sell 17 e Readers
to make \$150 or more over
the weekend

- b. Andy decides he wants to earn at least \$200. Write an inequality that can be used to calculate the number of eReaders he must sell.



$$200 \leq 93 + (.05)(69.99)x$$

Anchor 2

Litho 01910

Total Content Points: 2 (7.NS.A.3, 7.EE.B.4b)

Total Practice Points: 2 (MP1, MP2)

The student correctly calculates the number of eReaders Andy needs to sell by writing and solving an inequality algebraically (7.NS.A.3). In Part B, the student writes a correct inequality to calculate the number of eReaders Andy needs to sell (7.EE.B.4b). The student completes all parts of the problem and shows evidence of understanding that Andy works two days, that his income depends on the number of eReaders sold, and that the number needs to be rounded up to the next whole number to reflect that his income should be greater than or equal to \$150 (MP1). The student's inequality sign in Part A indicates understanding that the solution, 17, represents the minimum number of eReaders needed (MP2). Though the student sets up an inequality in Part A, the work shown indicates an equation in the second step, demonstrating a lack of precision (no credit for MP6).


Total Awarded Points: 4 out of 5

Constructed Response Assessment

eReader Sales Task

Andy works as a salesperson on Saturdays and Sundays at an electronics store. He is paid \$46.50 each day and, for every eReader he sells, he also earns 5% of the sale price. The store is selling eReaders this Saturday and Sunday for \$69.99.

- a. Andy wants his total earnings this weekend to be at least \$150. How many eReaders must he sell to reach his goal? Show your work and interpret your solution in the context of the problem.

 each day 46.50 \Rightarrow 93 for weekend

150	70
- 93	.05
-----	-----
58	3.50


35	16.5	round up
35	580.0	
-----	- 35	
	230	
	- 210	

	200	
	- 175	

	25	

17 or more

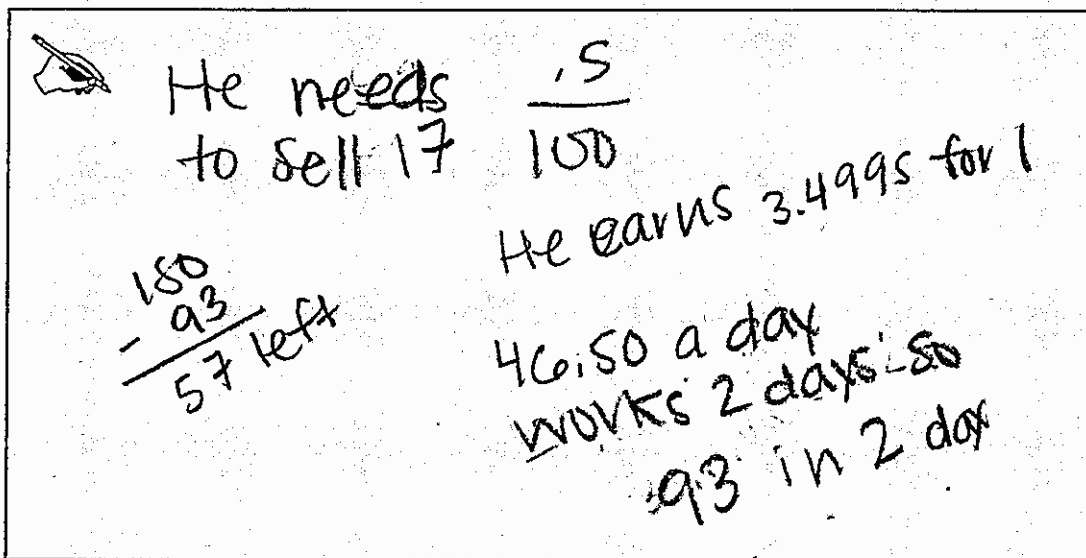
- b. Andy decides he wants to earn at least \$200. Write an inequality that can be used to calculate the number of eReaders he must sell.

 $(69.99)(.05)x + 93 \leq 200$

4. eReader Sales Task

Andy works as a salesperson on Saturdays and Sundays at an electronics store. He is paid \$46.50 each day and, for every eReader he sells, he also earns 5% of the sale price. The store is selling eReaders this Saturday and Sunday for \$69.99.

- a. Andy wants his total earnings this weekend to be at least \$150. How many eReaders must he sell to reach his goal? Show your work and interpret your solution in the context of the problem.



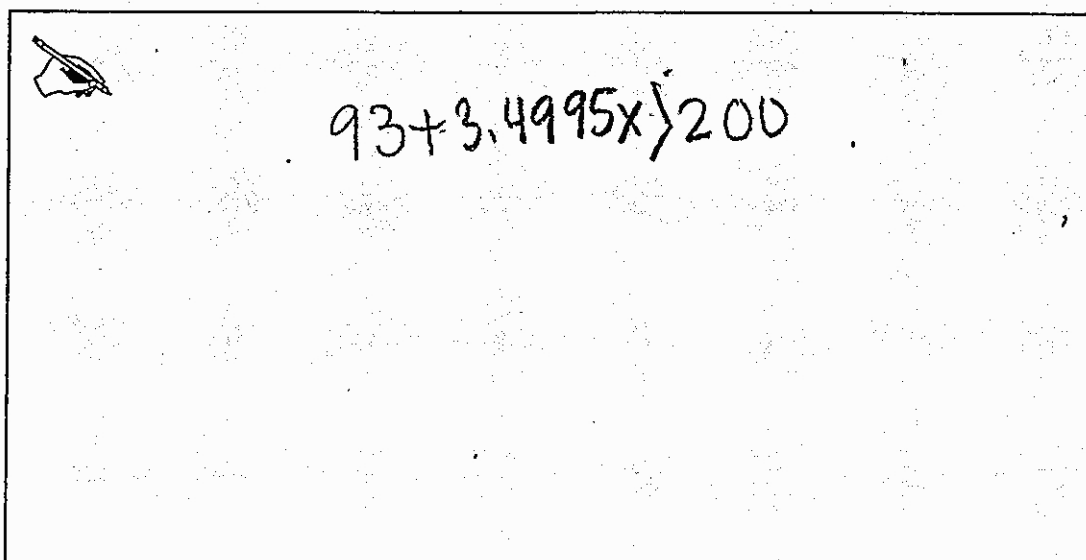
He needs to sell 17

$$\begin{array}{r} 150 \\ - 93 \\ \hline 57 \text{ left} \end{array}$$

He earns 3.4995 for 1

46.50 a day
WORKS 2 days = 93
93 in 2 days

- b. Andy decides he wants to earn at least \$200. Write an inequality that can be used to calculate the number of eReaders he must sell.



$93 + 3.4995x \geq 200$

Anchor 4

Litho 0075

Total Content Points: 2 (7.NS.A.3, 7.EE.B.4b)

Total Practice Points: 1 (MP1)

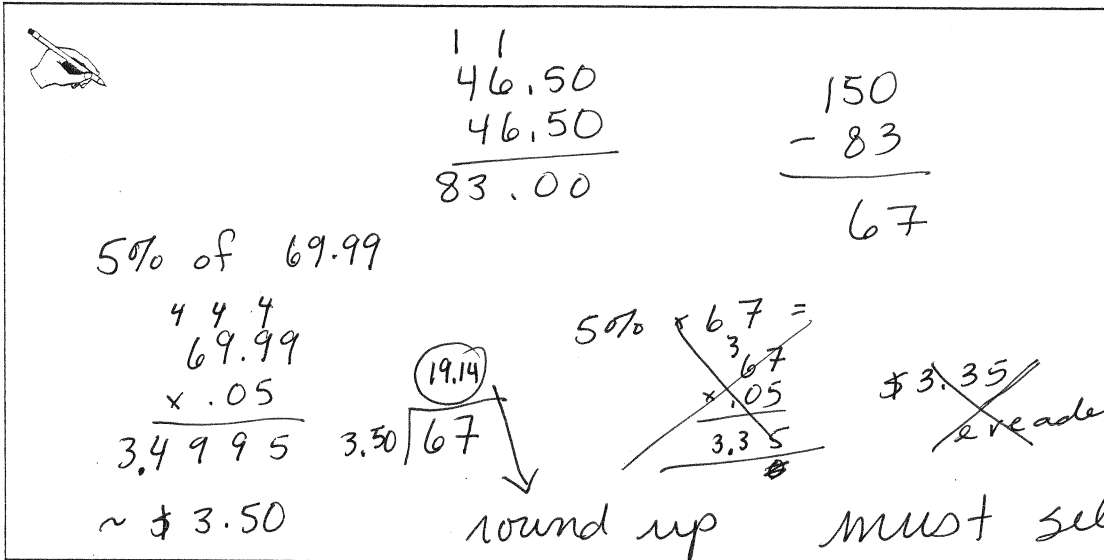
The student correctly calculates the number of eReaders Andy needs to sell by finding the difference between \$150 and his 2-day flat rate of pay and dividing that difference by 5% of the sale price of an eReader, though the final division step is not shown (7.NS.A.3). The student writes a correct inequality in Part B (7.EE.B.4b). The student completes all parts of the problem and shows evidence of understanding that Andy works two days, that his income depends on the number of eReaders sold, and that the number needs to be rounded up to the next whole number to reflect that his income should be greater than or equal to \$150 (MP1). The student does not interpret the solution in Part A as representing the minimum number of eReaders Andy needs to sell. Although the student has correctly rounded up to 17, the student never explicitly states that the 17 represents the minimum number of eReaders that must be sold with an inequality sign or words like “at least” or “or more” (no credit for MP2). The student fails to show the division step in Part A and also uses a greater than inequality sign in Part B rather than a greater than or equal to inequality sign, demonstrating a lack of precision (no credit for MP6).

Total Awarded Points: 3 out of 5

eReader Sales Task

Andy works as a salesperson on Saturdays and Sundays at an electronics store. He is paid \$46.50 each day and, for every eReader he sells, he also earns 5% of the sale price. The store is selling eReaders this Saturday and Sunday for \$69.99.

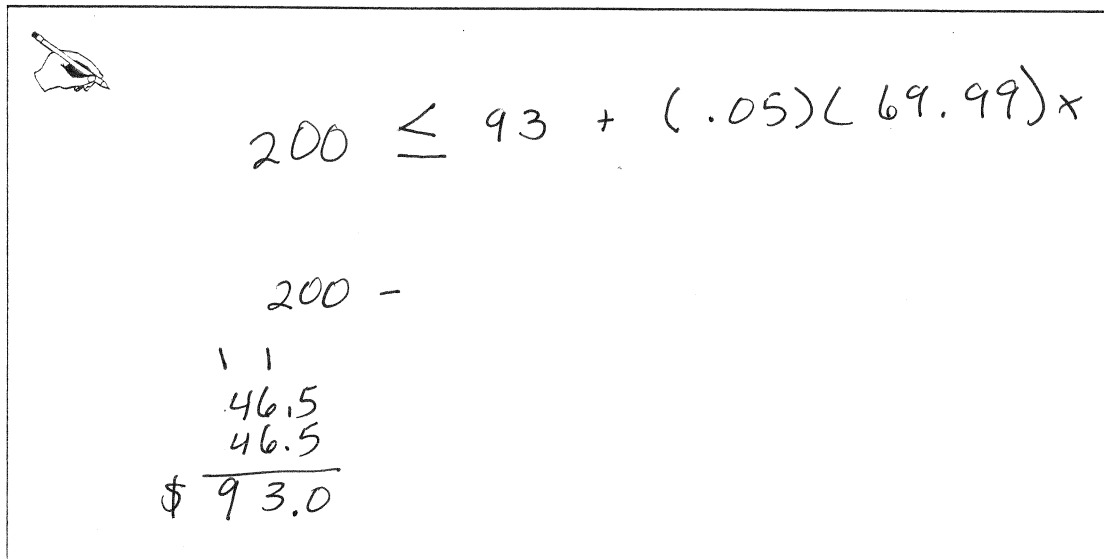
- a. Andy wants his total earnings this weekend to be at least \$150. How many eReaders must he sell to reach his goal? Show your work and interpret your solution in the context of the problem.



Handwritten work for problem a:

- Top left: A drawing of a hand holding a pen.
- Top middle: A vertical addition showing two days of earnings: $46.50 + 46.50 = 83.00$.
- Top right: A subtraction problem: $150 - 83 = 67$.
- Middle left: Calculation of 5% of 69.99: $69.99 \times 0.05 = 3.4995 \approx \3.50 .
- Middle: A division problem $3.50 \overline{)67}$ with a circled remainder of 19.14. An arrow points from the remainder to the text "round up".
- Middle right: A crossed-out calculation: $5\% \times 67 = 3.35$. Below it is $3.35 \times 20 = 67$. To the right, $\$3.35$ and "e reader" are crossed out.
- Bottom right: The text "must sell 20 e readers!" with an exclamation point.

- b. Andy decides he wants to earn at least \$200. Write an inequality that can be used to calculate the number of eReaders he must sell.



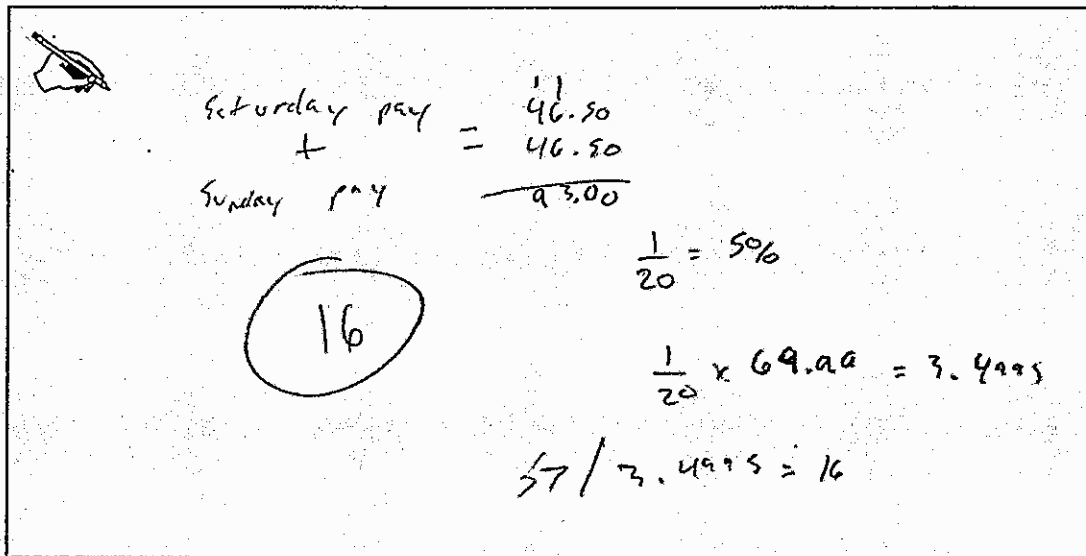
Handwritten work for problem b:

- Top left: A drawing of a hand holding a pen.
- Center: The inequality $200 \leq 93 + (.05)(69.99)x$.
- Middle: The number "200 -".
- Bottom: A vertical addition showing two days of earnings: $46.5 + 46.5 = \$93.0$.

4. eReader Sales Task

Andy works as a salesperson on Saturdays and Sundays at an electronics store. He is paid \$46.50 each day and, for every eReader he sells, he also earns 5% of the sale price. The store is selling eReaders this Saturday and Sunday for \$69.99.

- a. Andy wants his total earnings this weekend to be at least \$150. How many eReaders must he sell to reach his goal? Show your work and interpret your solution in the context of the problem.



Handwritten work for part a:

$$\begin{array}{r} \text{Saturday pay} = 46.50 \\ + \\ \text{Sunday pay} = 46.50 \\ \hline 93.00 \end{array}$$

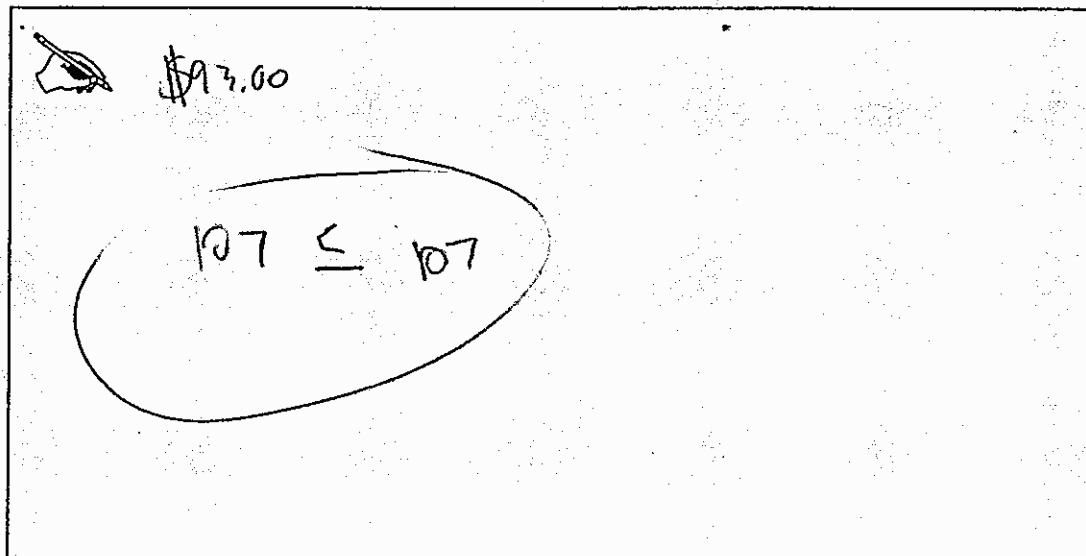
$$\frac{1}{20} = 5\%$$

$$\frac{1}{20} \times 69.99 = 3.4995$$

$$150 / 3.4995 = 16$$

The number 16 is circled.

- b. Andy decides he wants to earn at least \$200. Write an inequality that can be used to calculate the number of eReaders he must sell.



Handwritten work for part b:

$$107 \leq 107$$

The inequality is circled.

Anchor 6

Litho 0100

Total Content Points: 1 (7.NS.A.3)

Total Practice Points: 0


The student calculates the correct number of eReaders Andy needs to sell, rounding down to 16 instead of up to 17 (7.NS.A.3). The student does not write a correct inequality in Part B (no credit for 7.EE.B.4b). The student attempts all parts of the problem, but by rounding down to 16 instead of up to 17, fails to show understanding that the income should be greater than or equal to \$150 (no credit for MP1). The student does not interpret the solution in Part A as representing the minimum number of eReaders Andy needs to sell (no credit for MP2). The student rounds down to 16 in Part A without showing what is being rounded down, demonstrating a lack of precision (no credit for MP6).

Total Awarded Points: 1 out of 5

4. eReader Sales Task

Andy works as a salesperson on Saturdays and Sundays at an electronics store. He is paid \$46.50 each day and, for every eReader he sells, he also earns 5% of the sale price. The store is selling eReaders this Saturday and Sunday for \$69.99.

- a. Andy wants his total earnings this weekend to be at least \$150. How many eReaders must he sell to reach his goal? Show your work and interpret your solution in the context of the problem.


 $46.50 = 1 \text{ eReader}$ $1 \text{ eReader} = 9.30$
 $5\% = \text{Sale Price}$

$$\begin{array}{r} 9.30 \\ 5 \overline{)46.50} \\ \underline{45} \\ 15 \\ \underline{15} \\ 00 \end{array}$$

$$\begin{array}{r} 9.30x = 150 \\ \underline{9.30} \\ 9.30 \\ x = 16.129 \end{array}$$

He will have to sell at least 17 eReaders to reach his goal

- b. Andy decides he wants to earn at least \$200. Write an inequality that can be used to calculate the number of eReaders he must sell.

 $9.30x = 200$

Anchor 7

Litho 0008

Total Content Points: 0

Total Practice Points: 1 (MP2)


Although 17 is the right answer, the work shown demonstrates this to be coincidental since the process used to solve is completely incorrect (no credit for 7.NS.A.3). The student does not write an inequality in Part B (no credit for 7.EE.B.4b). The student attempts all parts of the problem but fails to show understanding that Andy works 2 days (no credit for MP1). The student interprets the solution in Part A as representing the minimum number of eReaders Andy needs to sell (“at least 17 eReaders”) (MP2). The student writes an equation instead of an inequality in Part B, demonstrating a lack of precision (no credit for MP6).

Total Awarded Points: 1 out of 5

4. eReader Sales Task


Andy works as a salesperson on Saturdays and Sundays at an electronics store. He is paid \$46.50 each day and, for every eReader he sells, he also earns 5% of the sale price. The store is selling eReaders this Saturday and Sunday for \$69.99.

- a. Andy wants his total earnings this weekend to be at least \$150. How many eReaders must he sell to reach his goal? Show your work and interpret your solution in the context of the problem.

 He would at least have to sell 30 eReaders.

30	70	105.0
× 3.5	× 0.5	46.5
150	35	151.5
900	\$3.5	
1050		

- b. Andy decides he wants to earn at least \$200. Write an inequality that can be used to calculate the number of eReaders he must sell.

 $\$200 = (165 \cdot 3.5) + 46.50$

Anchor 8

Litho 0076

Total Content Points: 0

Total Practice Points: 1 (MP2)

The student does not calculate the correct number of eReaders Andy needs to sell (no credit for 7.NS.A.3). The student does not write an inequality in Part B (no credit for 7.EE.B.4b). The student attempts all parts of the problem, but fails to show understanding that Andy works 2 days (no credit for MP1). The student interprets the solution in Part A as representing the minimum number of eReaders Andy needs to sell (“He would at least have to sell 30 eReaders”) (MP2). The student makes a multiplication error in Part A ($70 \times 0.5 = \$3.5$) and does not write an inequality in Part B, demonstrating a lack of precision (no credit for MP6).

Total Awarded Points: 1 out of 5

4. eReader Sales Task

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- a. Andy wants his total earnings this weekend to be at least \$150. How many eReaders must he sell to reach his goal? Show your work and interpret your solution in the context of the problem.

46.50
 $+ 5\%$

 46.55

69.99
 $+ 69.99$

 139.98
 69.99

 209.97

at least
3 or four
because it
won't add up
to 150, it
either is not
enough or more.

- b. Andy decides he wants to earn at least \$200. Write an inequality that can be used to calculate the number of eReaders he must sell.

$139.98 + x = 209.97$

He would have to sell at least
4 or 5 to get almost over 200.00
other wise he's under it.

Anchor 9

Litho 0049

Total Content Points: 0

Total Practice Points: 0


The student does not calculate the correct number of eReaders Andy needs to sell (no credit for 7.NS.A.3). The student does not write an inequality in Part B (no credit for 7.EE.B.4b). The student attempts all parts of the problem, but fails to show understanding that Andy works 2 days (no credit for MP1). The student does not interpret the solution in Part A as representing the minimum number of eReaders that must be sold. "At least 3 or four" does not demonstrate a clear understanding of the context of the problem, or that the solution should represent the smallest number of eReaders sold to result in an income of \$150 or greater (no credit for MP2). The student writes an equation instead of an inequality in Part B, demonstrating a lack of precision (no credit for MP6).

Total Awarded Points: 0 out of 5


4. eReader Sales Task

Andy works as a salesperson on Saturdays and Sundays at an electronics store. He is paid \$46.50 each day and, for every eReader he sells, he also earns 5% of the sale price. The store is selling eReaders this Saturday and Sunday for \$69.99.

- a. Andy wants his total earnings this weekend to be at least \$150. How many eReaders must he sell to reach his goal? Show your work and interpret your solution in the context of the problem.

 he at least needs to sell 2 eReaders so can get to his challenge and have a bit of extra money

- b. Andy decides he wants to earn at least \$200. Write an inequality that can be used to calculate the number of eReaders he must sell.

 he needs to sell at least 3 to get to 200 dollars a day, so he can get that same amount each day.

Anchor 10

Litho 0012

Total Content Points: 0

Total Practice Points: 0


The student does not calculate the correct number of eReaders Andy needs to sell (no credit for 7.NS.A.3). The student does not write an inequality in Part B (no credit for 7.EE.B.4b). The student attempts all parts of the problem but fails to show understanding that Andy works 2 days or that his income depends on the number of eReaders he sells (no credit for MP1). The student does not interpret the solution in Part A as representing the minimum number of eReaders. Although the phrase “at least needs to sell 2 eReaders” is used, the lack of work shown provides no solution to interpret (no credit for MP2). The student does not provide enough work overall to serve as evidence of precision (no credit for MP6).

Total Awarded Points: 0 out of 5

4. eReader Sales Task

Andy works as a salesperson on Saturdays and Sundays at an electronics store. He is paid \$46.50 each day and, for every eReader he sells, he also earns 5% of the sale price. The store is selling eReaders this Saturday and Sunday for \$69.99.


- a. Andy wants his total earnings this weekend to be at least \$150. How many eReaders must he sell to reach his goal? Show your work and interpret your solution in the context of the problem.

 ~~46.50~~
 Subtract 150

$$\begin{array}{r} 150 \\ - 46.50 \\ \hline 103.5 \end{array}$$

 20.7
 round to 21
~~103.5~~
 you get 103.5
 Divide $103.5 \div 5$
 you get 20.7
 You have to sell 20.7 e readers.

- b. Andy decides he wants to earn at least \$200. Write an inequality that can be used to calculate the number of eReaders he must sell.

 25.7

Anchor 11

Litho 0014

Total Content Points: 0

Total Practice Points: 0

The student does not calculate the correct number of eReaders Andy needs to sell (no credit for 7.NS.A.3). The student does not write an inequality in Part B (no credit for 7.EE.B.4b). The student attempts all parts of the problem, but fails to show understanding that Andy works 2 days (no credit for MP1). The student does not interpret the solution in Part A as representing the minimum number of eReaders Andy needs to sell; rounding 20.7 up to 21 is insufficient to demonstrate this concept (no credit for MP2). The student does not attempt to work through enough of the problem asked in Part B to demonstrate precision (no credit for MP6).

Total Awarded Points: 0 out of 5