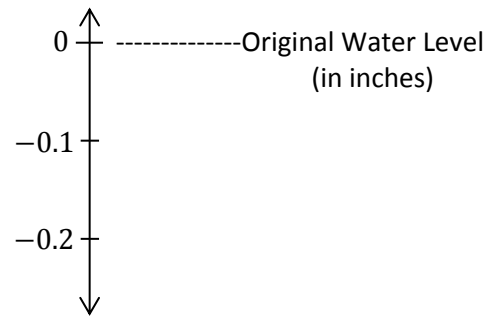Name _____   Date _____

1. The water level in Ricky Lake changes at an average of $-\dfrac{7}{16}$ inch every 3 years.

    a. Based on the rate above, how much will the water level change after one year? Show your calculations and model your answer on the vertical number line, using 0 as the original water level.

$$0 \quad ------------\text{Original Water Level}$$
$$\text{(in inches)}$$
$$-0.1$$
$$-0.2$$

    b. How much would the water level change over a 7-year period?

    c. When written in decimal form, is your answer to part (b) a repeating decimal or a terminating decimal? Justify your answer using long division.
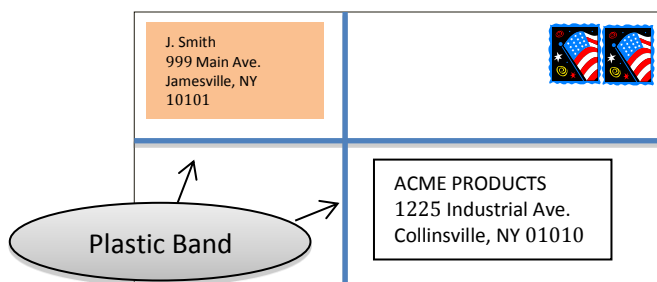
2. Kay's mother taught her how to make handmade ornaments to sell at a craft fair. Kay rented a table at the fair for $30 and set up her work station. Each ornament that she makes costs approximately $2.50 for materials. She sells each ornament for $6.00.

   a. If x represents the quantity of ornaments sold at the craft fair, which of the following expressions would represent Kay's profit? (Circle *all* choices that apply.)

      A. $-30 + 6x - 2.50x$

      B. $6x - 30 - 2.50x$

      C. $6x - 30$

      D. $4.50x - 30$

      E. $3.50x - 30$

   b. Kay does not want to lose money on her business. Her mother told her she needs to sell enough ornaments to at least cover her expenses (costs for materials and table rental). Kay figures that if she sells 8 ornaments, she covers her expenses and does not lose any money. Do you agree? Explain and show work to support your answer.

   c. Kay feels that if she earns a profit of $40.00 at this craft fair, her business will be successful enough to attend other craft fairs. How many ornaments does she have to sell to earn a $40.00 profit? Write and solve an equation; then explain how the steps and operations used in your algebraic solution compare to an arithmetic solution.

3. Travis received a letter from his bank saying that his checking account balance fell below zero. His account transaction log is shown below.

| CHECK NO.	DATE	DESCRIPTION OF TRANSACTION	PAYMENT	DEPOSIT	BALANCE	
---	10/17	Beginning Balance	---	---	$367.50	
1125	10/18	CBC Audio (Headphones)	$62.00		−62.00	
					$305.50	Line 1
1126	10/22	NY Sport (Basketball Shoes)	$87.00		−87.00	
					$218.50	Line 2
Debit	10/25	Gary's Country Market	$38.50		−38.50	
					$180.00	Line 3
1127	10/25	Iggy's Skate Shop (Skateboard)	$188.00		−188.00	
					$8.00	Line 4
	10/25	Cash Deposit (Birthday Money)		$20.00	+20.00	
					$28.00	Line 5
Debit	10/30	McDonuts	$5.95		−5.95	
					$22.05	Line 6

a. On which line did Travis make a mathematical error? Explain Travis' mistake.

b. The bank charged Travis a $20 fee because his balance dropped below $0. He knows that he currently has an outstanding charge for $7.85 that he has not recorded yet. How much money will Travis have to deposit into his account so that the outstanding charge does not create another bank fee? Explain.

4. The length of a rectangular envelope is $2\frac{1}{2}$ times its width. A plastic band surrounds the front and back of the envelope to secure it as shown in the picture. The plastic band is $39\frac{3}{8}$ inches long. Find the length and width of the envelope.
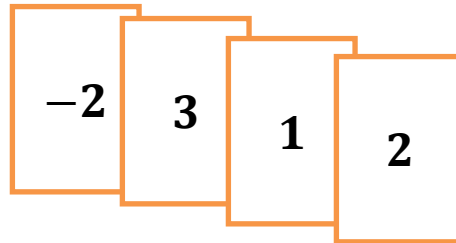
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10101

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1225 Industrial Ave.
Collinsville, NY 01010

Plastic Band

5. Juan and Mary are playing the integer card game. The cards in their hands are shown below:

Juan's Hand
$3, 4, 9, -12$

Mary's Hand
$-2, 3, 1, 2$

| 3 | 4 | 9 | −12 |

| −2 | 3 | 1 | 2 |
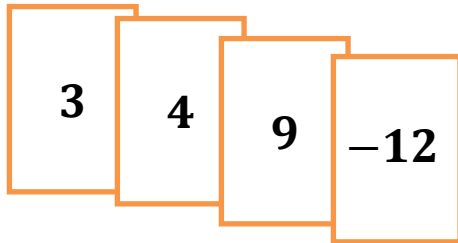
a. What are the scores in each of their hands?

Juan's score: Mary's score:

b. Lydia says that if Juan and Mary both take away their 3s, Juan's score will be higher than Mary's. Marcus argues and says that Juan and Mary's scores will be equal. Are either of them right? Explain.

c. Juan picks up another set of cards that is exactly like each card in his hand. Which of the following would make Mary's score equal to Juan's? Place a check mark ✓ by all that apply.

_____Double every card in her hand   _____Take away her 3 and 1

_____Pick up a 4   _____Take away her 2 and −2

_____Pick up a 7 and −3   _____Pick up one of each of Juan's cards

Explain why your selections will make Juan's and Mary's scores equal.

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A Progression Toward Mastery					
Assessment Task Item		**STEP 1** Missing or incorrect answer and little evidence of reasoning or application of mathematics to solve the problem	**STEP 2** Missing or incorrect answer but evidence of some reasoning or application of mathematics to solve the problem	**STEP 3** A correct answer with some evidence of reasoning or application of mathematics to solve the problem, OR an incorrect answer with substantial evidence of solid reasoning or application of mathematics to solve the problem	**STEP 4** A correct answer supported by substantial evidence of solid reasoning or application of mathematics to solve the problem
1	**a** 7.NS.A.2b	Student incorrectly calculates the water level change with either no model shown or the model shown does not relate to the answer given.	Student sets up the problem correctly but makes an error in computation resulting in an incorrect value and incorrectly models the answer.	Student uses a sound process to determine and model the answer on the number line, but a computational error results in an incorrect value. OR Student correctly calculates a change of $-\frac{7}{48}$ inches but has an error in the number line representation.	Student correctly states that the water level changes $-\frac{7}{48}$ inches after one year and correctly models the change on the number line.
	b 7.NS.A.2a	Student answer is incorrect. Student work shows little or no understanding of how to find the water level change over a 7-year period.	Student uses an appropriate method to find the water level change, but a computational error results in an incorrect value and does not correctly interpret that value to describe the change.	Student uses an appropriate method to find and express the 7-year water level change, but a computational error results in an incorrect value. OR Student states a change of $1\frac{1}{48}$ inches but does not indicate the sign or direction of that change.	Student correctly states the $-1\frac{1}{48}$ inch change in the water level over a 7-year period and uses an appropriate method to obtain the answer.

	c **7.NS.A.2d**	Student is unable to demonstrate correct use of the long division algorithm.	Student shows partial understanding of the long division algorithm but does not complete the process.	Student uses long division to determine and justify the decimal form of the answer, but a computational error results in an incorrect value. OR Student shows the correct long-division work to arrive at a decimal remainder but does not use a repeat bar to indicate a repeat pattern.	Student correctly uses the long division algorithm to determine that $1\frac{1}{48}$ is the repeating decimal $1.0208\overline{3}$ (or that $-1\frac{1}{48}$ equals $-1.0208\overline{3}$). OR Student uses the long division algorithm to correctly determine and state the decimal form of a different answer that is recorded in part (b).
2	**a** **7.EE.A.2**	Student does not circle any of A, B, or E. OR Student circles only one of A, B, and E and circles C and/or D. OR Student circles all choices. OR Student does not circle any choices.	Student circles only two of A, B, and E and also circles C or D. OR Student circles only one of A, B, and E.	Student circles only two out of A, B, and E.	Student circles only choices A, B, and E.
	b **7.NS.A.3**	Student shows some accuracy in mathematical computation, but the work is not relevant. Student fails to provide an explanation or provides an incorrect explanation.	Student arrives at a value of -2 for the amount of money Kay made from selling 8 ornaments but incorrectly agrees with the claim. OR Student does not make a statement to agree or disagree.	Student arrives at a value of -2 for the amount of money Kay made from selling 8 ornaments and disagrees with the statement but does not provide a complete explanation. OR Due to a minor computational error, student arrives at an incorrect answer but includes a sound explanation based on that numerical answer.	Student correctly disagrees with the statement and supports the answer with the appropriate work. For instance, student shows that $3.50(8) - 30 = -2$, which means Kay would have lost $2.
	c **7.NS.A.3** **7.EE.B.4a**	Student answer is incorrect. Little or no evidence of reasoning is provided.	Student answer is incorrect but shows some evidence of reasoning through the use of an equation and/or arithmetic steps to model and solve the problem (though the	Student uses a correct equation and method (e.g., $3.50x - 30 = 40$ and finds 20 to be the number of ornaments Kay must sell) but does not provide an explanation for how the	Student correctly states that Kay must sell 20 ornaments to earn a $40 profit and includes a correct equation and relates the steps in the solution to an arithmetic model with no errors in

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			model used may be incorrect).	steps or solution compares to an arithmetic solution. OR Student uses a correct equation and method and relates it to an arithmetic model but makes a computational error resulting in an incorrect value.	the steps taken to arrive at the answer.
3	**a** **7.NS.A.1**	Student does not provide a correct explanation. Student identifies a different line and shows little or no evidence of understanding integer subtraction.	Student correctly identifies line 4 but does not explain the mistake or state a correct value for line 4. OR Student makes an error in computation and states an incorrect value for line 4. OR Student identifies another line as being Travis' mistake, due to a computational error, but shows an understanding of integer subtraction.	Student correctly identifies line 4 and states that the value should instead be −$8 but does not clearly explain the mistake. OR Student clearly explains the mistake but does not provide the correct value.	Student correctly identifies line 4, states that Travis mistakenly obtained a positive difference from 180 − 188 and states that the value on line 4 should instead be −$8.
	b **7.NS.A.1**	Student is unable to answer the question accurately. Student makes several errors in calculating the correct account balance and necessary deposit, which shows a limited level of understanding.	Student uses an incorrect beginning balance (such as $22.05 from line 6) to calculate the new account balance but performs all other calculations correctly and explains that the account balance needs to be at least $0. OR Student corrects Travis' initial error and arrives at an account balance of $6.05 but does not complete the other necessary steps to determine the deposit needed.	Student answers incorrectly due to a computational error but uses a sound process and valid explanation of how much Travis should deposit into the account (based on the incorrect value). OR Student shows a correct process and arrives at a new balance amount of −$21.80 but does not provide a complete explanation of how much money Travis needed to deposit.	Student calculates the correct account balance of −$21.80 showing appropriate work, states the need for a deposit of $21.80 or more to avoid overdraft and explains that the deposit is necessary to reach a balance of at least $0.

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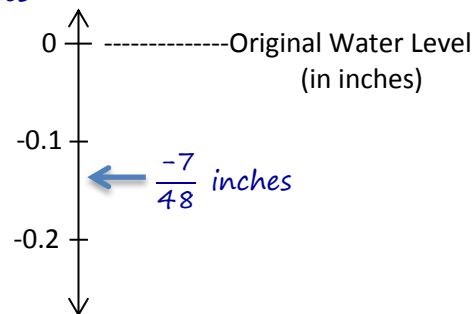|					
4	**7.NS.A.3** **7.EE.B.4a**	Student answers incorrectly and shows little or no understanding of how to find the missing dimensions of the envelope.	Student uses a valid process to arrive at either a correct length of $14\frac{1}{16}$ inches or width of $5\frac{5}{8}$ inches but does not provide both dimensions. OR Student relates the length and width backwards, resulting in a length of $5\frac{5}{8}$ inches and a width of $14\frac{1}{16}$ inches.	Student provides appropriate work and correct numerical values for the answer but without the units of measure. OR Student provides incorrect answer values based on a computational error but uses a valid method (i.e., $2w + 5w = 39.375$) and shows correct steps.	Student correctly answers a length of $14\frac{1}{16}$ inches and width of $5\frac{5}{8}$ inches and provides error-free work to support the answer.
5	**a** **7.NS.A.1**	Student is unable to correctly answer the question. Student work is missing or does not demonstrate an adequate understanding of integer addition.	Student correctly indicates that Juan and Mary each have scores of 4 but does not show supporting work.	Student calculates and shows that one of the scores is 4, but for the other hand, a computational error is made resulting in a different value.	Student correctly calculates and shows that Juan and Mary each have scores of 4.
	b **7.NS.A.1**	Student states that Lydia is correct OR states that neither person is correct.	Student states that Marcus is correct but provides no explanation as to why.	Student states that Marcus is correct, but the explanation is incomplete.	Student states that Marcus is correct and provides a valid argument as justification.
	c **7.NS.A.3**	Student checks both of the incorrect choices and the written explanation shows little or no understanding.	Student places check marks by only two of the correct choices (and possibly one of the incorrect choices). Student explanation indicates a limited level of understanding.	Student provides all but one of the following: ▪ Student places check marks by only the four correct answers; ▪ Student explains that Juan's score is 8 because it was doubled; ▪ Student explains why the selections will make the scores equal. OR Student checks only 3 of the 4 correct choices but appropriately addresses all other parts of the question.	Student places check marks by only the four correct answers and explains that Juan's score is 8 because it was doubled and accurately explains why the selections will make the scores equal.

Name _____   Date _____

1. The water level in Ricky Lake changes at an average of $-\frac{7}{16}$ inch every 3 years.

   a. Based on the rate above, how much will the water level change after one year? Show your calculations and model your answer on the vertical number line, using 0 as the original water level.

$$
\begin{array}{r}
0\,.\;1\;4\;5 \\
48\,\overline{\smash{)}\,7\,.\;0\;0\;0\;0} \\
-\;4\;8 \\
\hline
2\;2\;0 \\
-\;1\;9\;2 \\
\hline
2\;8\;0 \\
-\;2\;4\;0 \\
\hline
4\;0
\end{array}
$$

$$\frac{-7}{13} \div 3 \implies \frac{-7}{13} \cdot \frac{1}{3} \implies \frac{-7}{48} \text{ inches}$$

0 + - - - - - - - - - - - -Original Water Level
                              (in inches)

-0.1 + $\frac{-7}{48}$ inches

-0.2 +

   b. How much would the water level change over a 7-year period?

$$
\begin{aligned}
\text{Distance} &= \text{rate} \times \text{time} \\
&= -\frac{7}{48} \times 7 \\
&= -\frac{49}{48} \\
&= -1\frac{1}{48} \text{ inches}
\end{aligned}
$$

The water level drops $1\frac{1}{48}$ inches over a 7 year period.

   c. When written in decimal form, is your answer to part (b) a repeating decimal or a terminating decimal? Justify your answer using long division.

$$
\begin{array}{r}
0\,.\;0\;2\;0\;8\;3\;3 \\
48\,\overline{\smash{)}\,1\,.\;0\;0\;0\;0\;0\;0} \\
-\;\;\;9\;6 \\
\hline
4\;0 \\
-\;\;\;0\;0 \\
\hline
4\;0\;0 \\
-\;\;3\;8\;4 \\
\hline
1\;6\;0 \\
-\;\;1\;4\;4 \\
\hline
1\;6\;0
\end{array}
$$

$-1\frac{1}{48}$ written in decimal form is a repeating decimal because when converted using long division, the remainder repeats after the hundred-thousandths place.

2. Kay's mother taught her how to make handmade ornaments to sell at a craft fair. Kay rented a table at the fair for $30 and set up her work station. Each ornament that she makes costs approximately $2.50 for materials. She sells each ornament for $6.00.

    a. If x represents the quantity of ornaments sold at the craft fair, which of the following expressions would represent Kay's profit? (Circle *all* choices that apply.)

    - (A.) $-30 + 6x - 2.50x$
    - (B.) $6x - 30 - 2.50x$
    - C. $6x - 30$
    - D. $4.50x - 30$
    - (E.) $3.50x - 30$

    b. Kay does not want to lose money on her business. Her mother told her she needs to sell enough ornaments to at least cover her expenses (costs for materials and table rental). Kay figures that if she sells 8 ornaments, she covers her expenses and does not lose any money. Do you agree? Explain and show work to support your answer.

    $$3.50x - 30$$
    $$3.50(8) - 30$$
    $$(24 + 4) - 30$$
    $$28 - 30$$
    $$-2$$

    I disagree with Kay because selling 8 ornaments covers most of her costs but still leaves her $2 in debt.

    c. Kay feels that if she earns a profit of $40.00 at this craft fair, her business will be successful enough to attend other craft fairs. How many ornaments does she have to sell to earn a $40.00 profit? Write and solve an equation; then explain how the steps and operations used in your algebraic solution compare to an arithmetic solution.

    $$3.50x - 30 = 40$$
    $$3.50x - 30 + 30 = 40 + 30$$
    $$3.50x + 0 = 70$$
    $$3.50x = 70$$
    $$3.50x\left(\frac{1}{3.50}\right) = 70\left(\frac{1}{3.50}\right)$$
    $$1x = 20$$

    Kay must sell 20 ornaments.

    To find the answer arithmetically, I would have to combine the $40 profit and $30 rental fee, then divide that sum ($70) by the $3.50 that she earns per ornament after costs.

3. Travis received a letter from his bank saying that his checking account balance fell below zero. His account transaction log is shown below.

CHECK NO.	DATE	DESCRIPTION OF TRANSACTION	PAYMENT	DEPOSIT	BALANCE	
---	10/17	Beginning Balance	---	---	$367.50	
1125	10/18	CBC Audio (Headphones)	$62.00		−62.00	
					$305.50	Line 1
1126	10/22	NY Sport (Basketball Shoes)	$87.00		−87.00	
					$218.50	Line 2
Debit	10/25	Gary's Country Market	$38.50		−38.50	
					$180.00	Line 3
1127	10/25	Iggy's Skate Shop (Skateboard)	$188.00		−188.00	
					$8.00	Line 4
	10/25	Cash Deposit (Birthday Money)		$20.00	+20.00	
					$28.00	Line 5
Debit	10/30	McDonuts	$5.95		−5.95	
					$22.05	Line 6

a. On which line did Travis make a mathematical error? Explain Travis' mistake.

On line 4, Travis subtracted $188 from $180 and got a positive answer. The difference should be -$8.00.

b. The bank charged Travis a $20 fee because his balance dropped below 0. He knows that he currently has an outstanding charge for $7.85 that he has not recorded yet. How much money will Travis have to deposit into his account so that the outstanding charge does not create another bank fee? Explain.
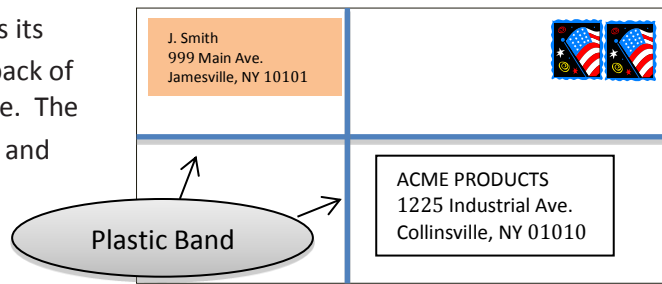
Starting at Line 3:

$$180.00 - 188.00 + 20.00 - 5.95$$
$$-8.00 + 20.00 - 5.95$$
$$12.00 - 5.95$$
$$6.05$$

Travis' actual balance should be $6.05.

6.05 + (-20.00) overdraft fee
|-20.00| − |6.05|
-13.95

-13.95 + (-7.85) outstanding charge
|-13.95| + |-7.85|
-21.80

To get his account back to 0, Travis needs to deposit $21.80 or more to avoid another overdraft fee.

4. The length of a rectangular envelope is $2\frac{1}{2}$ times its width. A plastic band surrounds the front and back of the envelope to secure it as shown in the picture. The plastic band is $39\frac{3}{8}$ inches long. Find the length and width of the envelope.

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Plastic Band

The length of the plastic band is equivalent to the perimeter of the envelope.

Width: w

Length = $2\frac{1}{2}$ × width

$w + w + \left(2\frac{1}{2}w\right) + \left(2\frac{1}{2}w\right) = 39\frac{3}{8}$

$2w + 5w = 39\frac{3}{8}$

$7w = 39\frac{3}{8}$

$7w = \frac{315}{8}$

$\left(\frac{1}{7}\right)(7w) = \left(\frac{315}{8}\right)\left(\frac{1}{7}\right)$

$w = \frac{45}{8} = 5\frac{5}{8}$ inches

Length = $2\frac{1}{2}w$

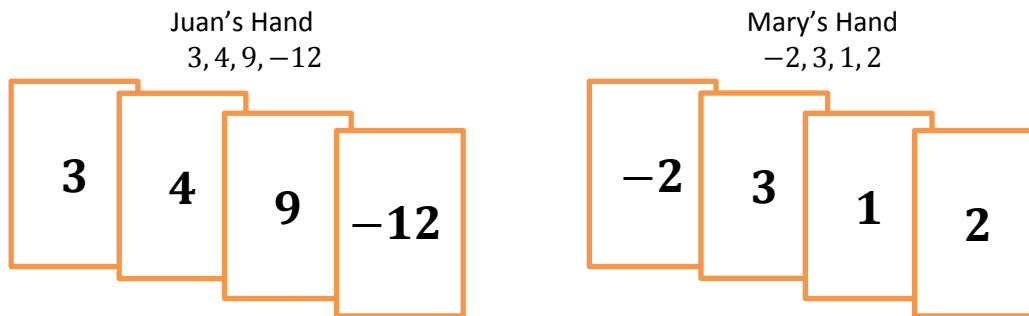Length = $2\frac{1}{2}\left(5\frac{5}{8}\right)$

Length = $\frac{5}{2} \times \frac{45}{8}$

Length = $\frac{225}{16} = 14\frac{1}{16}$ inches

The length of the envelope is $14\frac{1}{16}$ inches and the width is $5\frac{5}{8}$ inches.

5. Juan and Mary are playing the integer card game. The cards in their hands are shown below:

Juan's Hand
$3, 4, 9, -12$

| 3 | 4 | 9 | −12 |

Mary's Hand
$-2, 3, 1, 2$

| −2 | 3 | 1 | 2 |

a. What are the scores in each of their hands?

Juan's Score: 4
$3 + 4 + 9 + (-12)$
$7 + 9 + (-12)$
$16 + (-12)$
4

Mary's Score: 4
$-2 + 3 + 1 + 2$
$1 + 1 + 2$
4

b. Lydia says that if Juan and Mary both take away their 3s, Juan's score will be higher than Mary's. Marcus argues and says that Juan and Mary's scores will be equal. Are either of them right? Explain.

If both Juan and Mary lay down their 3's, then both of their totals will be decreased by 3. Since both of their totals are 4, laying down a 3 would make both scores 1. Juan's score and Mary's score would be equal, so Marcus is correct.

c. Juan picks up another set of cards that is exactly like each card in his hand. Which of the following would make Mary's score equal to Juan's? Place a check mark ✓ by all that apply.

✓ Double every card in her hand
   + total of 4

✓ Pick up a 4
   + 4

✓ Pick up a 7 and −3
   + 4

____ Take away her 3 and 1

____ Take away her 2 and d −2

✓ Pick up one of each of Juan's cards
   + 4

Explain why your selections will make Juan and Mary's scores equal.

Juan's total doubles because every card in his hand doubled, so his total is 8. Each choice I selected would add 4 to Mary's total to make it 8.