

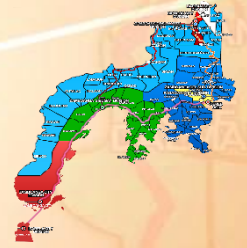


Republic of the Philippines
Department of Education
 Regional Office IX, Zamboanga Peninsula



- JANUARY**
Matuguhon
- FEBRUARY**
Mahiguagmaan
- MARCH**
Matinabungan
- APRIL**
Matinahuron
- MAY**
Makapsay og Malimpyo
- JUNE**
*Maabtik og Masunod sa
Dhasaklong Oras*
- JULY**
Maantigo og Maabilidad
- AUGUST**
*Maginhuhuhunon
para sa Uban*
- SEPTEMBER**
Madaginoton
- OCTOBER**
Matinud-anon
- NOVEMBER**
Masaligan
- DECEMBER**
Maalampon

5



Zest for Progress
 Zeal of Partnership

Mathematics

Quarter 3 – Module 6:
 Find What’s Missing?



Name of Learner: _____

Grade & Section: _____

Name of School: _____



What I Need to Know

After going through this module, you are expected to:

1. Formulates the rule in finding the next term in a sequence.
2. Uses different strategies to solve for the unknown in simple equations involving one or more operations on whole numbers and fractions.



What I Know

Directions: Choose the letter of the correct answer.

1. What is the Pattern Rule of 23, 31, 39, 47, and 55?
A. $\times 3$ B. $+ 8$ C. $+3-1$ D. $\times 8$
2. What is the missing term in the sequence of 112, 105, 98, _____, 84?
A. 90 B. 89 C. 91 D. 99
3. Find the next four terms in the sequence 1, 4, 9, 16, _____, _____, _____, _____.
A. 22, 33, 44, 55 C. 26, 36, 46, 56
B. 25, 36, 49, 64 D. 27, 38, 49, 65
4. Find the missing term of the sequence 2, 6, 18, _____, 162, _____.
A. 28 and 182 C. 54 and 486
B. 36 and 176 D. 64 and 586
5. Find the missing term in the sequence 1, 2, 6, _____, 120.
A. 12 B. 24 C. 48 D. 96
6. The first week of Horse patrol had 3 members. The second week had five members. The third week had eight members and the fourth had twelve. If this pattern continues, how many members will show up for eight week?
A. 36 B. 38 C. 40 D. 42
7. Stella ran a lemonade stand for 5 days. On the first day, she made ₱100.00. Every day after that, she made ₱200.00 more than the previous day. How much money did she make in all after 5 days?
A. ₱700.00 C. ₱900.00
B. ₱800.00 D. ₱1000.00
8. The troop leader baked some cookies for the camper's bake sale. Franco bought 3 of the cookies and Chandra bought 2. Mang Wally bought 1 dozen of the cookies. William and Starlet each bought 6 cookies. Then Ms. Lira

bought 4 of the cookies. That left only 3 cookies for Sam to buy. How many cookies did the troop leader bake for the sale?

- A. 32
B. 34
C. 36
D. 38

9. I think of a number and add three to it, multiply the result by 2, subtract 4 and divide by 7. The number I end up with is 2. What was the number I first thought of?

- A. 2
B. 4
C. 6
D. 8

10. Buddy was trying to decide when to get up in the morning. He needs 45 minutes to get ready for school. It takes him 25 minutes to drive to school. He wanted to get to school 20 minutes early to use the library. If school starts at 7:30, what time should he get up?

- A. 5:30
B. 5:45
C. 5:55
D. 6:00



What's In

Fill in the table with the correct information.

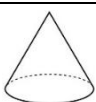
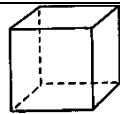
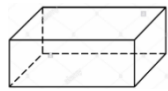

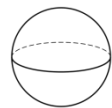
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 <p>2. Name: _____</p>				
 <p>3. Name: _____</p>				
 <p>4. Name: _____</p>				
 <p>5. Name: _____</p>				

Image 1 & 2: mathblog.com; Image 3: varsitytutors.com; Image 4: [Luis Costa / Alamy Stock Vector](#); Image 5: shutterstock.com



What's New

Problem Situation

(Formulates the rule in finding the next term in a sequence)

Seven days before her Girl Scout leader's birthday, Mira planned to give her flowers. On the first day, she sent one flower. On the second day, she sent three flowers. On the third day, she sent five flowers, and so on. How many flowers did Mira send to her Girl Scout leader on the seventh day?

Comprehension questions

1. Who planned to send flower to her Girl Scout leader?

2. How many flower did she send on the first day?

3. How many flowers did she send on the second day?

4. How many flowers did she send on the third day?

5. What will you do to know the number of flowers send on the fourth day? Fifth day? Sixth day? Seventh day?



What is it

Based on the given problem situation.

For questions number 2, 3, and 4, write your answers in the table below.

Day	1st	2nd	3rd	4th	5th	6th	7th
No. of Flowers	1	3	5	?	?	?	?

There is a difference of 2 between 2nd day and 1st day, if I add 2 to 1 it becomes 3. On the 3rd day, still there is a difference of 2 from the 3rd day to the 2nd day.

Solution:

$$\begin{array}{ccccccccc} 1 & , & 3 & , & 5 & , & 7 & , & 9 & , & 11 & , & 13 \\ \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} \\ (1+2=3) & (3+2=5) & (5+2=7) & (7+2=9) & (9+2=11) & (11+2=13) & & & & & & & & \end{array}$$

Therefore, Mira will send 7 flowers on the 4th day, 9 flowers on the 5th day, 11 flowers on the 6th day, and 13 flowers on the 7th day.

- There are problems in Math that can be solved by observing sequences and patterns.
- A *sequence* is a list of numbers or objects in a defined or logical order.
- A *number sequence* is a list of numbers in which successive terms follow a rule or pattern. Each number in a sequence is called a *term*.
- *Patterns* are repetitive sequences and can be found in nature, shapes, events, sets of numbers and almost everywhere you care to look.
- By studying the sequence of numbers, we can find the rule governing the terms. The rule can tell us what number will come next in the sequence

Source: Angelina P. Lumbre, et al., 21st Century MATHletes, ed. Mercurio T. Elenzano and Chin Uy, PhD, Vibal Group, Inc., 2016, p.251

Consider the following examples:

Example 1: Find the next three terms of the sequence 2, 4, 8, 16, __, __, __

$$\begin{array}{ccccccccc} 2 & , & 4 & , & 8 & , & 16 & , & \underline{\hspace{1.5em}} & , & \underline{\hspace{1.5em}} & , & \underline{\hspace{1.5em}} \\ \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} & \underbrace{\hspace{1.5em}} \\ x2 & & x2 & & x2 & & x2 & & x2 & & x2 & & x2 \end{array}$$

Solution:

The Rule is multiply **by 2**.

$$2 \times 2 = 4$$

$$4 \times 2 = 8$$

$$8 \times 2 = 16$$

$$16 \times 2 = \mathbf{32}$$

$$32 \times 2 = \mathbf{64}$$

$$64 \times 2 = \mathbf{128}$$

Therefore, the next three terms of the sequence are **32, 64, and 128**.

Example 2:

Study the following number chart:

①	2	③	4	5	⑥	7	8	9	⑩
11	12	13	14	⑮	16	17	18	19	20
⑳	22	23	24	25	26	27	㉘	29	30
31	32	33	34	35	㉙	37	38	39	40
41	42	43	44	㉛	46	47	48	49	50

Chart 1: Shows Number Sequence 1- 50

Solution:

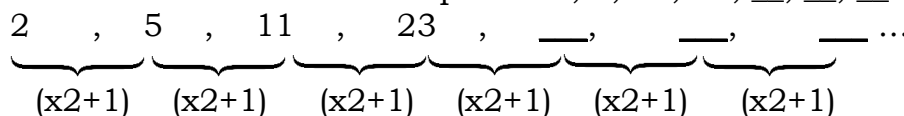
Look at the encircled numbers in the chart. Study the difference of each term. Write in the blank the difference of one term to its next term.

Number Sequence	Term	Rule
1	1 st term	+2
3	2 nd term	+3
6	3 rd term	+4
10	4 th term	+5
15	5 th term	+6
21	6 th term	+7
28	7 th term	+8
36	8 th term	+9
45	9 th term	

The difference between the 1st term to the next term is increasing from 2 to 9.

Example 3:

Find the next three terms of the sequence 2, 5, 11, 23, __, __, __ ...



Solution:

Rule: Multiply by 2 and add 1.

$2 \times 2 + 1 = 5$	$47 \times 2 + 1 = \mathbf{95}$
$5 \times 2 + 1 = 11$	$95 \times 2 + 1 = \mathbf{191}$
$11 \times 2 + 1 = 23$	
$23 \times 2 + 1 = \mathbf{47}$	

Therefore, the next three terms of the sequence are **47, 95, and 191**.
The sequence is 2, 5, 11, 23, 47, 95, and 127.

Problem Situation

(Uses different strategies (looking for a pattern, working backwards, etc.) to solve for the unknown in simple equations involving one or more operations on whole numbers and fractions.)

A car rental agency has two plans. Under plan A, a car is rented for ₱ 80.00 plus ₱ 20.00 for each additional day. Under plan B, a car is rented for ₱120.00 plus ₱15.00 for each additional day. What number of days would result in the same cost?

Understand

- a. What is asked?

(What number of days results in the same cost?)

b. What are the given facts?

(Under plan A, A car is rented for ₱ 80.00 plus ₱20.00 for each additional day.

Under plan B, a car is rented for ₱ 120.00 plus ₱15.00 each additional day.)

Solving the problem using the looking for a pattern strategy:

Strategy 1.

Plan A											
Day 1	80	20									100
Day 2	80	20	20								120
Day 3	80	20	20	20							140
Day 4	80	20	20	20	20						160
Day 5	80	20	20	20	20	20	20				180
Day 6	80	20	20	20	20	20	20	20			200
Day 7	80	20	20	20	20	20	20	20	20		220
Day 8	80	20	20	20	20	20	20	20	20	20	240

Plan B											
Day 1	120	15									135
Day 2	120	15	15								150
Day 3	120	15	15	15							165
Day 4	120	15	15	15	15						180
Day 5	120	15	15	15	15	15	15				195
Day 6	120	15	15	15	15	15	15	15			210
Day 7	120	15	15	15	15	15	15	15	15		225
Day 8	120	15	15	15	15	15	15	15	15	15	240

A car rented for 8 days will have the same cost under Plan A and Plan B.

Source: Angelina P. Lumbre, et al., 21st Century MATHletes, ed. Mercurio T. Elenzano and Chin Uy, PhD, Vibal Group, Inc., 2016, p.268-270

Strategy 2.

Plan A.

Day	1	2	3	4	5	6	7	8
Amount	80+20	120	140	160	180	200	220	240

+20 +20 +20 +20 +20 +20 +20 +20

Plan B.

Day	1	2	3	4	5	6	7	8
Amount	120+15	150	165	180	195	210	225	240

+15 +15 +15 +15 +15 +15 +15 +15

Example 2:

Solve $5a + 9 = 4a + 15$

Looking for a pattern of $5a + 9$ equation

Strategy 1.

a= 1	9	5								14
a= 2	9	5	5							19
a= 3	9	5	5	5						24
a= 4	9	5	5	5	5					29
a= 5	9	5	5	5	5	5				34
a= 6	9	5	5	5	5	5	5			39

Looking for a pattern of $4a + 15$ equation:

a= 1	15	4								19
a= 2	15	4	4							23
a= 3	15	4	4	4						27
a= 4	15	4	4	4	4					31
a= 5	15	4	4	4	4	4				35
a= 6	15	4	4	4	4	4	4			39

Strategy 2.

$5a + 9$	a	1	2	3	4	5	6
$5 + 9$		14	19	24	29	34	39

+5 +5 +5 +5 +5

$4a + 15$	a	1	2	3	4	5	6
$4 + 15$		19	23	27	31	35	39

+4 +4 +4 +4 +4

Solving the problem using the working backwards strategy:

Example 1:

Amihan received a weekly allowance of ₱500.00 from her grandparents. She wants to save some money for her Girl Scout registration. On Monday, she deposited ₱25.00 in her piggy bank. She deposited twice as much on Wednesday and Friday. How much money did Amihan deposit?

Solution:

Let's do it backwards.

Friday twice as much - (2 x ₱25.00)

Wednesday twice as much - (2 x ₱25.00)

Monday - (Php25.00)
 $= (2 \times 25) + (2 \times 25) + 25 = n$
 $50 + 50 + 25 = \text{P}125.00$

Therefore, Amihan deposited/saved **₱125.00** from her allowance.

Example 2:

Sally cycles $\frac{1}{3}$ of the the way to school and then is driven the remaining 6km by a friend’s family. How far does she live from the school?

Solution: $\frac{2}{3} = 6 \text{ km}$ $\frac{1}{3} = 3 \text{ km}$ **Answer:** $\frac{3}{3} = \mathbf{9 \text{ km}}$

Example 3:

Danaya had some guavas. She gave Ben 15 guavas and then bought 1 more guava. She gave Cathy 10 guavas and bought another 2 guavas. If she had 6 guavas left in the end, how many guavas did Danaya have at first?

Graphic Organizer for Solving a Word Problem in Math

<p>Study the Problem *Students could rewrite the problem here. *Highlight the question (i.e., What is the problem asking me to find?)</p>	<p>How many guavas did Danaya have at first?</p>
<p>Organize the Facts * List the facts. Cross out any unnecessary information</p>	<p>*Danaya gave 15 guavas to Ben *She bought 1 more guava *She gave Cathy 10 guavas *She bought another 2 guavas *She had 6 guavas left in the end</p>
<p>Line Up a Plan * Decide what steps you need to take to solve the problem.</p>	<p>Using Working Backward solution.</p>
<p>Verify Your Plan with Action * Put the numbers into your plan * (Solving Backward)</p>	<p>n -15 +1 -10 +2 = 6 = 6 - 2 +10 -1 +15 = 28 n = 28</p>
<p>Evaluate Your Answer *Rewrite your answer in a complete sentence.</p>	<p>Danaya have 28 guavas at first.</p>

Remember:

To solve a problem using **working backwards strategy** find the solution to a problem by starting with the answer and using inverse operations to undo the steps stated in the problem.

e.g. $a + b = c$: $c - a = b$



What's More

Activity 1

My Term, My Rule

Directions: Write the rule of the given sequence of numbers, then find the next term.

1. 12, 17, 22, 27, 32, _____ Rule: _____
2. 24, 30, 36, 42, 48, _____ Rule: _____
3. 60, 56, 52, 48, 44, _____ Rule: _____
4. 8, 16, 32, 64, 128, _____ Rule: _____
5. 2, 8, 32, 128, 512, _____ Rule: _____

Activity 2

Connect My Rule

Directions: Study the given sequence of terms. Then match the given sequence to the correct pattern or rule by connecting it with a line. Number 1 is done for you.

SEQUENCE OF TERMS

1. 5, 15, 45, 135
2. 4, 7, 10, 13
3. 6, 11, 16, 21
4. 2, 7, 22, 67,
5. 10, 22, 46, 94
6. 3, 12, 57, 282

PATTERN OR RULE

- A. 
- B. 
- C. 
- D. 
- E. 
- F. 
- G. 

Activity 3**Find Me Up!****Directions:** Find the missing terms and write the rule:

Example:

5, 6, 8, 11, 15, 20Rule: +1, +2, +3, +4, and +5

1. 37, 39, 42, _____, 51, _____

Rule: _____

2. 99, 110, _____, 132, 143, _____

Rule: _____

3. 4, 12, 36, _____, 324, _____

Rule: _____

4. 6, 11, _____, 21, 26, _____, 36

Rule: _____

5. 112, 105, 98, _____, 84, _____

Rule: _____

Activity 4**Oh My Pattern!****Directions:** Look for a pattern to solve the problem.

1. Flowers on a Sampaguita started to bloom. If they continued this pattern, how many will bloom on the 4th day?

	Day 1	Day 2	Day 3	Day 4
No. of Flowers	10	30	50	

Pirena charges ₱50.00 for each hour she babysits.

For question No. **2** and **3**. Refer to the situation above.

2. How much does Pirena earn when he works 2 hours? And 4 hours? Show your results in a table.

Answer: _____

3. Use the pattern in the table to predict how much Pirena will earn working 5 hours? And 6 hours?

Answer: _____

4. Elena collected pechay from her garden. She collected 1 pechay from the first garden bed, 2 from the second, 4 from the third garden bed and 8 from the fourth garden bed. Elena could not see a pattern forming. Can you predict how many pechay she would find the next garden bed?

	First Garden Bed	Second Garden Bed	Third Garden Bed	Forth Garden Bed	Fifth Garden Bed
No. of Pechay	1	2	4	8	

5. There are 16 books in a box. How many book are there in 6 boxes?

No. of Boxes	1	2	3	4	5	6
No. of Books	16	32	48	64	80	

Activity 5

What's My Pattern?

Directions: Complete the Graphic Organizer Using the Looking for a Pattern Strategy.

Lila Sari was trying to finish all her math homework on Friday. She did 3 problems the first 30 minutes, 4 problems the next 30 minutes, 6 problems the next 30 minutes, 9 problems the next 30 minutes, and so forth. If she continues to work at this rate, how many problems will she have done in 4 hours?

<p>What is the problem?</p> <p>Underline the important information.</p>	<p>How could I work this out?</p> <p><input type="checkbox"/> Draw a picture</p> <p><input type="checkbox"/> Use a number</p> <p><input type="checkbox"/> sentence</p> <p><input type="checkbox"/> Act it out</p> <p><input type="checkbox"/> Make a table</p> <p>Find a pattern</p> <p>Work backward</p> <p>Use tally marks</p>
<p>My Problem Solving Math</p>	<p>My Answer</p>
<p>Work it out!</p>	<p>Do you think my answer sounds right?</p> <p>Yes <input type="checkbox"/></p> <p>No <input type="checkbox"/></p>

Activity 6

Work Me Backward

Directions: Work backward to solve each problem.

1. Jimmy is on page 80 of his Math Book. The book has a total of 256 pages. How many pages does he still have to read?
2. After finishing her shopping, Chelsea wants to have ₱25.00 left. She plans to buy sandals for ₱45.00 and a purse for ₱20.00 How much money does she need?
3. Hannah ordered 2 suits for ₱75.00 each and a pair of shoes. The total cost was ₱395.00. What was the cost of the shoes?
4. Mikko had ₱500.00. He plans to buy board game worth of ₱200.00, a toy car for ₱100.00 and saved the rest of his money for savings. How much money does Mikko have for savings?
5. Arkhe walked from Taway to Tenan. It took 1 hour 20 minutes to walk from Taway to Sanito. Then it took 25 minutes to walk from Sanito to Tenan. He arrived in Tenan at 2:45 P.M. At what time did he leave Taway?



What I Have Learned

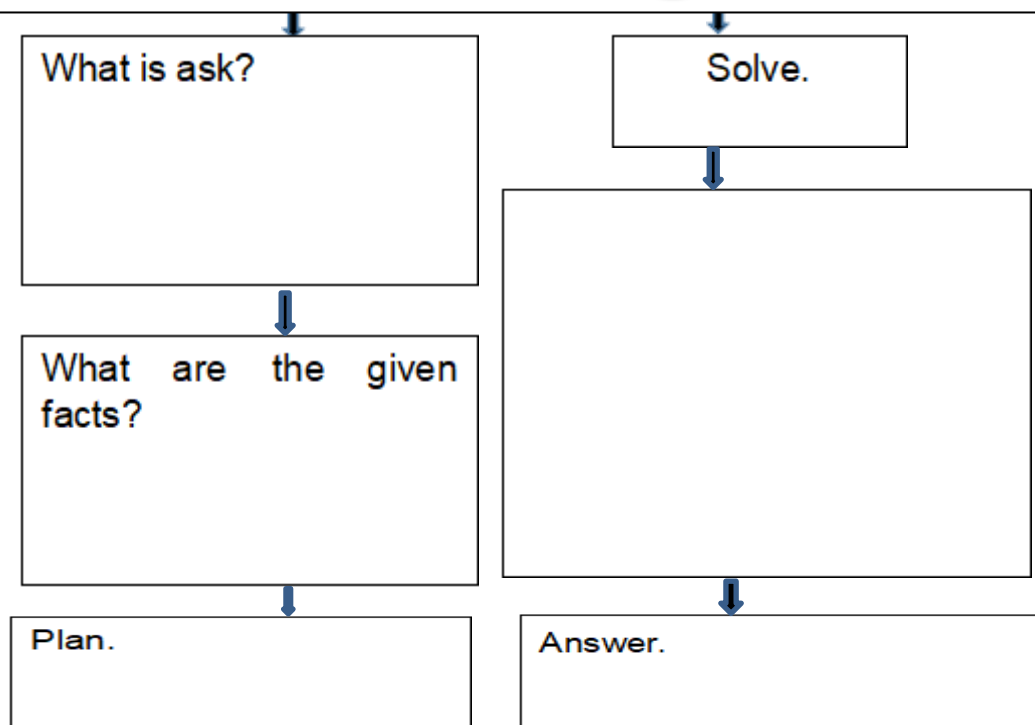
Activity 7

Back! Back! Backward Solving!

Directions: Answer the word problem solving backward by using the graphic organizer.

Brian gave 10 mangoes from his farm to both Sam and Rome. Then he gave 14 mangoes to Kathy and 6 mangoes to Grace. He still had 275 mangoes. How many mangoes were in Brian's farm to begin with?

Problem Solving Format





What I Can Do

Activity 8

A. Directions: Find the next three terms of the sequence and give the pattern rule.

Formulating the rule in finding the next term in a sequence.

Using different strategies (looking for a pattern, working backwards, etc.) to solve for the unknown in simple equations involving one or more operations on whole numbers and fractions. e.g. $3 \times _ + 1 = 10$ (the unknown is solved by working backwards)

- 37, 39, 41, __, __, __
Rule: _____
- 1, 4, 16, __, __, __
Rule: _____
- 3, 13, 53, __, __, __
Rule: _____

B. Directions: Translate each problem into equation. Then solve.

- Ann wants to buy a new guitar that costs ₱880.00. Every time she cooked bibingka, she earns ₱110.00. If this pattern continues, how many times did Ann will have to cooked bibingka to buy the guitar?
Answer: _____
- A number is increased by 10 is equal to 25. What is a number?
Answer: _____



Assessment

Directions: Choose the letter of the correct answer.

- What is the Pattern Rule of 18, 27, 36, 45, and 54?
A. + 7
B. + 8
C. + 9
D. + 10
- What is the missing term in the sequence of 99, 111, 123, __, 147?
A. 135
B. 136
C. 137
D. 138
- Find the next four terms in the sequence 103, 97, 91, 85, __, __, __, __.
A. 59, 53, 47, 41
B. 69, 63, 57, 51
C. 78, 72, 66, 60
D. 79, 73, 67, 61
- Find the missing term of the sequence 2, 8, 32, __, 512, ____.
A. 127 and 2047
B. 128 and 2048
C. 129 and 2094
D. 130 and 2015

5. Find the missing term in the sequence 1, 3, 7, ____, 31.
A. 13
B. 14
C. 15
D. 16
6. The first day of Eagle patrol had 4 members. The second day had six members. The third day had nine members and the fourth had thirteen. If this pattern continues, how many members will show up for eight day?
A. 37
B. 38
C. 39
D. 40
7. Mia ran a milk tea stand for 5 days. On the first day, she made ₱120.00. Every day after that, she made ₱210.00 more than the previous day. How much money did she make in all after 5 days?
A. ₱900.00
B. ₱920.00
C. ₱940.00
D. ₱960.00
8. Aling Mildred baked some cookies for the school bake sale. Fe bought 4 of the cookies and Marites bought 5. Nene bought $\frac{1}{2}$ dozen of the cookies. Denzzel and Noel each bought 6 cookies. Then Lola Magda bought 3 of the cookies. That left only 4 cookies for Sam to buy. How many cookies did Aling Mildred bake for the sale?
A. 32
B. 34
C. 36
D. 38
9. A number increased by 4, multiply by 2 subtract 4 and divide by 8. The number I end up with is 3. What was the number?
A. 8
B. 9
C. 10
D. 11
10. Linda wants to arrive 15 minutes earlier in their dance contest practice every Saturday morning. She needs 10 minutes to fix her bed and another 10 minutes to take a bath. It takes 15 minutes to eat breakfast. He needs to walk 20 minutes to their venue. If their practice starts at 8:00, what time should she alarm the clock to wake her up?
A. 6:45
B. 6:50
C. 6:55
D. 7:00

References

Lumbre, Angelina P. et al.. 2016. *21st Century Mathletes Textbook for Grade 5*. Quezon City: Vibal Group, Incorporated.

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