COASTMETRO
ELEMENTARY MATH PROJECT

GRADE 6 PRACTICE QUESTIONS

PATTERNS

GRADE 6 PATTERNS
CLOSED QUESTIONS

1. For each growing visual pattern:
a. What is changing?
b. What is growing?
c. Draw what comes next?
d. Create a table of values that represents the information.
e. What will the 10th term be?

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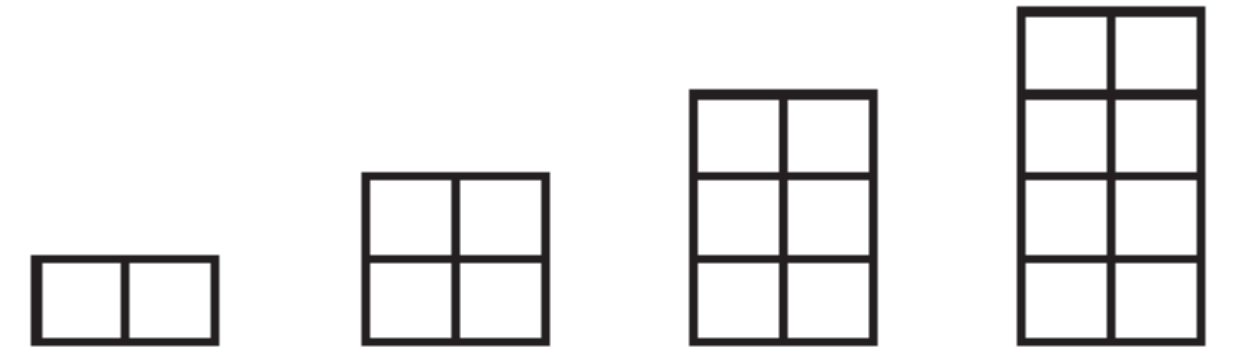

Figure 1 Figure 2 Figure 3 Figure 4

2. Draw a line from the pattern to the formula to match each pattern with its composite general rule.

2,3,4,5, ...	4n + 2
34, 33, 32, 31, ...	n + 1
6, 10, 14, 18, ...	35 -1

3. Which type of rule is this? Start at 6 and add 2 each time to create a sequence.

a. Create the sequence.

b. Write a composite general rule for making the sequence directly from the term number.

4. Write both types of rules (recursive and composite) for each sequence.

a. 98, 85, 72, 59, ...

b. 7, 13, 19, 25, ...

c. 3, 6, 9, 12, ...

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a. 98, 85, 72, 59, ...

b. 7, 13, 19, 25, ...

c. 3, 6, 9, 12, ...

5. One flowerpot costs $47.

a. How much does it cost to buy 2 flowerpots? 3 Flowerpots?

b. Make a table of values to represent the number of flowerpots and cost.

c. Use the pattern to predict the cost of 20 flowerpots.

d. Write a pattern rule for the cost and use it to determine what the cost of 150 flowerpots would be.

6. A certain marigold variety can grow up to 240 cm tall. It grows 20 cm each week, starting at 0 cm when it first appears.

a. In which week will the marigold first reach 240 cm? Explain your reasoning.

b. How tall will the marigold be at the end of Week 7?

c. Make a table showing, Week Number and Height (cm). What kind of pattern is this?

7. What Is the Same? What Is Different?

Sequence A: 2, 5, 8, 11, 14…

Sequence B: 20, 17, 14, 11, 8…

Describe what's the same about these two sequences and what's different. Justify your thinking using math. For example, you can use tables, graphs, rules to show your thinking.

GRADE 6 PATTERNS
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8. True or False? Every growing sequence can also be seen as a decreasing (shrinking) sequence if you read it backwards. True or false? Provide two examples or counterexamples and explain.

9. What's My Rule? I have a sequence where each term equals the previous term multiplied by 1.2 then minus 3. My first term is 10.

a. Write out Terms 1 through 5.

b. Explain in words how the pattern grows or shrinks.

c. Could this ever produce a term that is exactly 0? Why or why not?

GRADE 6 PATTERNS
OPEN QUESTIONS

10. Create an increasing pattern where Term 2 has 8 circles and another term has 24 circles. Represent the pattern in at least 3 other ways (e.g., picture, table of values, graph, pattern rule to show which term has 24 circles).

11. Emma puts aside money each week into her “future fund.” Her plan:
In Week 1 she saves $5.
In Week 2 she adds $2 more than she did in Week 1.
In Week 3 she adds $2 more than she did in Week 2.
And so on…each week’s deposit is $2 more than the previous week’s.

a. Create a table of values showing how much Emma deposits in Weeks 1 through 6

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b. Plot these deposits on a graph (Week on the horizontal axis, Deposit on the vertical).

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And so on…each week’s deposit is $2 more than the previous week’s.

c. Describe the pattern in words. What’s the “rule” for finding Week n’s deposit?

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And so on…each week’s deposit is $2 more than the previous week’s.

d. Use your rule to predict how much she will deposit in Week 10.

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In Week 3 she adds $2 more than she did in Week 2.
And so on…each week’s deposit is $2 more than the previous week’s.

e. Calculate the total amount Emma will have saved after 10 weeks.

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GRADE 6 PRACTICE QUESTIONS

ALGEBRA

GRADE 6 ALGEBRA
CLOSED QUESTIONS

1. Determine the value of each candy. Show your thinking.

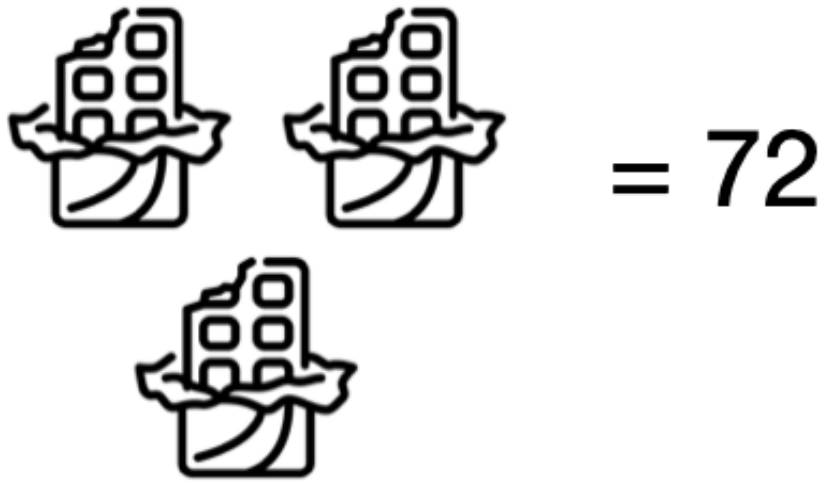
a.

$+ \quad 17 = 38$

GRADE 6 ALGEBRA
CLOSED QUESTIONS

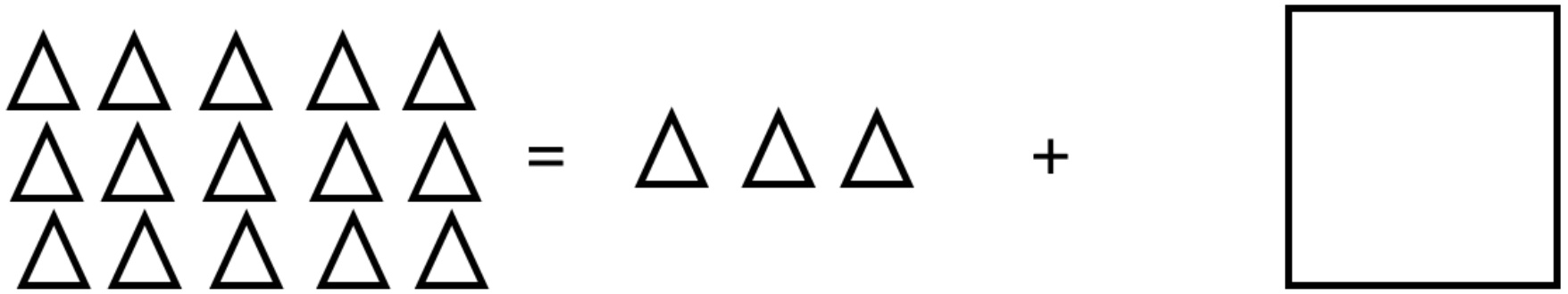
1. Determine the value of each candy. Show your thinking.

b.



GRADE 6 ALGEBRA
CLOSED QUESTIONS

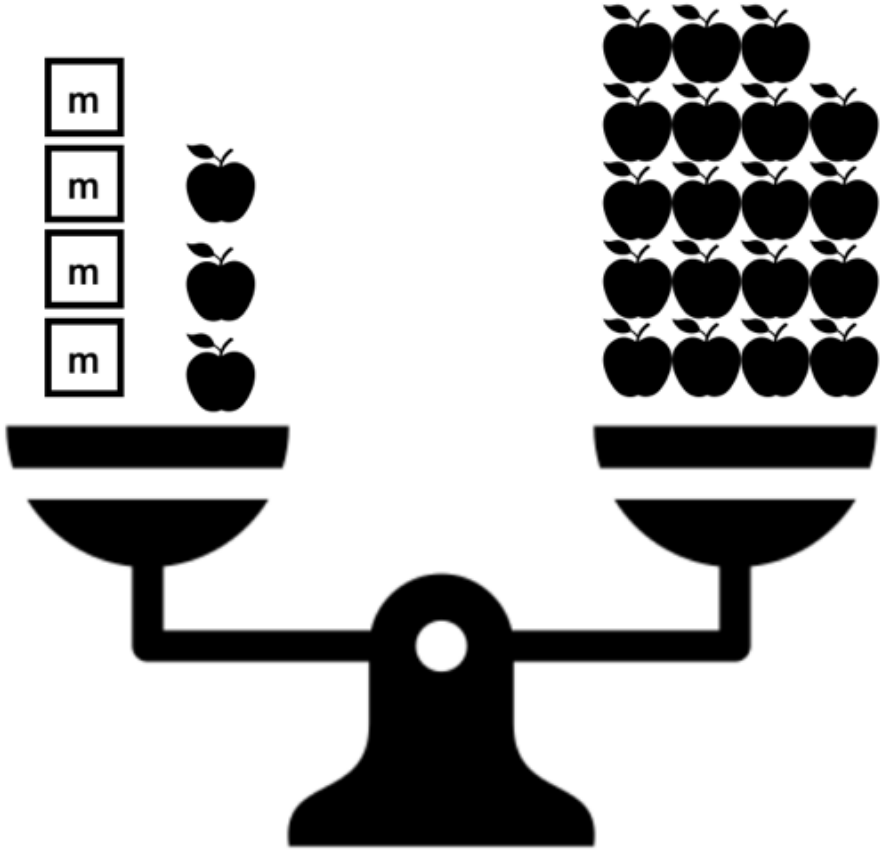
2. What equation represents the picture?
How many triangles are in the box?



3. What number added to 7 gives 23? Write an equation to represent the problem, then solve using inspection.

GRADE 6 ALGEBRA
CLOSED QUESTIONS

4. Write an equation to represent the pan balance. Solve the equation to find the value of the unknown (m).



5. Guess and test to find the solution.

a. $38 = 8 + x$

b. $48 = 2x$

6. Solve each equation using algebra tiles, then check your solutions using another method.

a. $x + 4 = 9$

b. $2y = 12$

7. Solve each equation using a strategy of your choice. Show your thinking. Which strategy did you use? Why?

a. $p + 3 = 26$

b. $18 = n + 2$

c. $74 = y - 15$

d. $6b = 42$

e. $9 = 45 \div p$

8. Find the number that goes in place of each symbol or variable to make a true statement.

a. $20 - z = 15$

b.  $\div 7 = 2$

c. 8  $= 4$

d. $13t = 9$

9. Write a mathematical statement for each of the word sentences.

a. A number plus 7 is equal to 9.

b. Twenty-five plus two times a number is seven.

c. The sum of three times a number and four is equal to thirty.

10. Create a picture to model the equation, $4n + 2 = 8$

11. Write an equation that can be used to solve the problem.
“Who am I?”
a. After adding 12 t both sides of my equation, I became x = 20. What is my original equation?

b. After dividing both sides of my equation by 7, I became n = 2. What was my original equation?

GRADE 6 ALGEBRA
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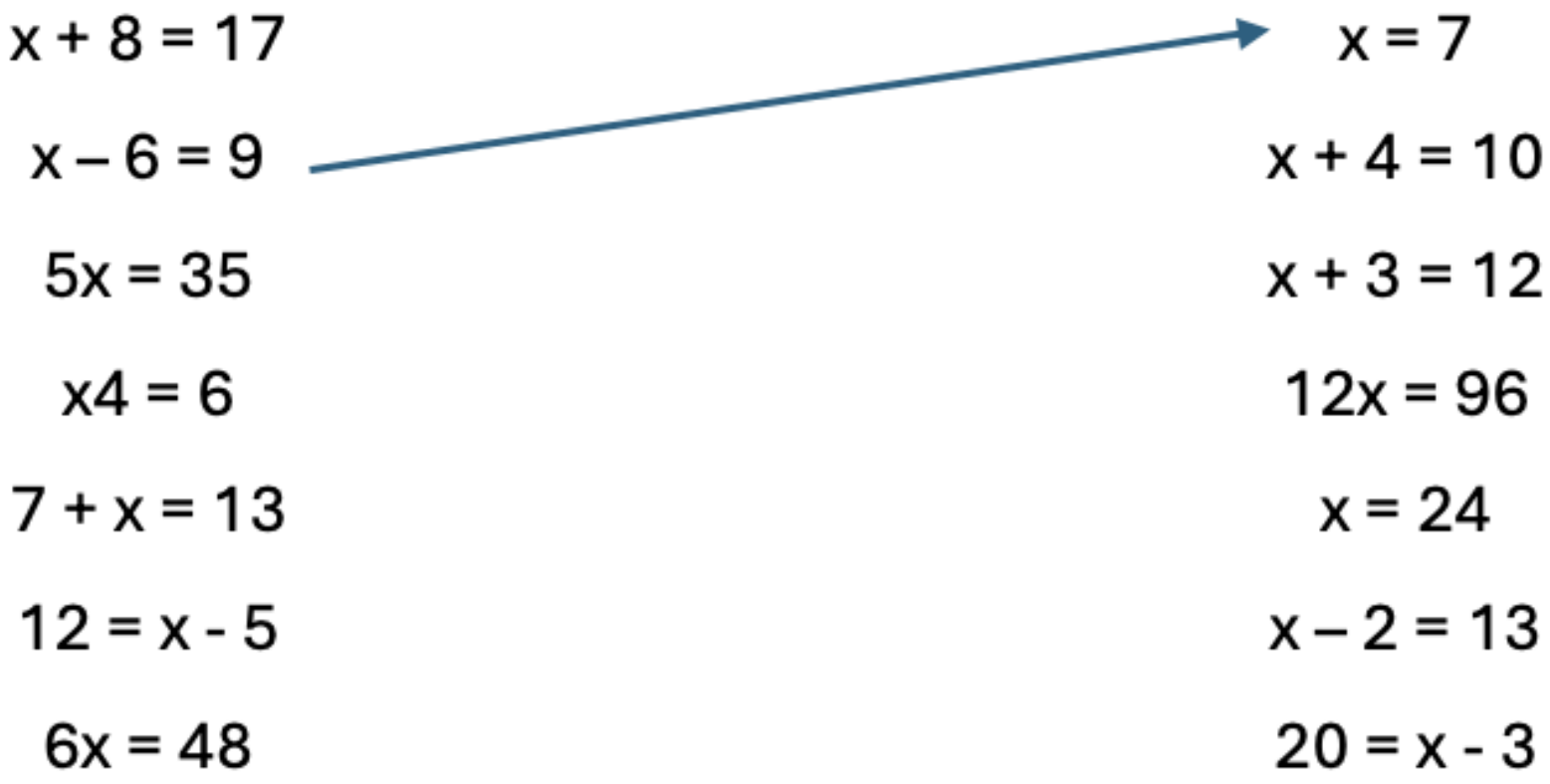
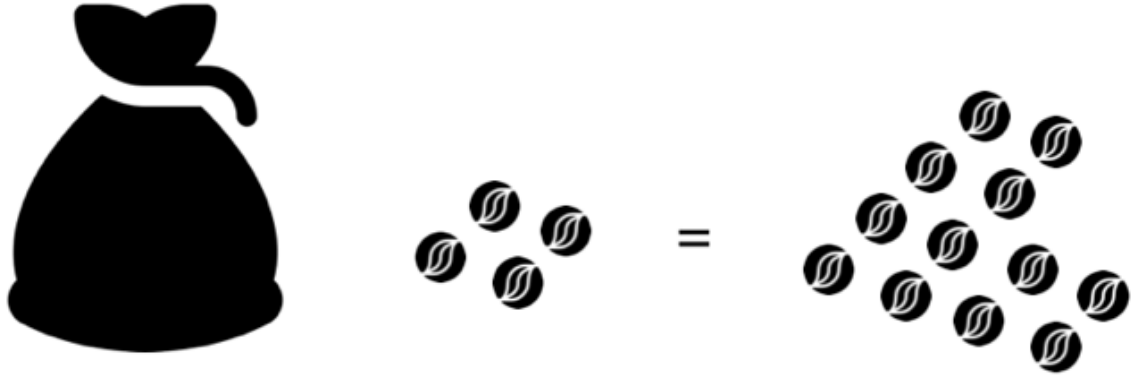
12. Match each equation on the left with an equivalent form of it on the right by drawing an arrow from left to right. The first one is done for you.



GRADE 6 ALGEBRA
OPEN QUESTIONS

13. How many marbles are in the bag? How do you know? When there is more than one bag, each bag contains the same number of marbles.

a.



GRADE 6 ALGEBRA
OPEN QUESTIONS

13. How many marbles are in the bag? How do you know? When there is more than one bag, each bag contains the same number of marbles.

b.

14. Show three ways to solve each equation. Represent your thinking using pictures, symbols and words.

a. $a - 3 = 15$

b. $3p = 45$

15. Which method of solving one-step equations do you prefer (e.g., guess and test, inspection, bar model, balance, algebra tiles, etc.)? Show an example to explain your choice.

16. What could the value of each symbol be? Explain your thinking.