

## Unit 8: Patterns and Algebra

### Quiz (Lessons 8–12) — ON

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. Calculate the numerical expression.

a)  $(2 + 3) \times 4 =$

b)  $2 + (3 \times 4) =$

c)  $8 \div (6 - 2) =$

2. Solve the equation by guessing and checking.

a)  $4 + \square = 11$

b)  $\square - 7 = 6$

**BONUS ►**  $32 - \square = 17$

3. Solve the equation by writing the unknown by itself.

a)  $4 \times \square = 12$

b)  $\square - 8 = 9$

**BONUS ►**  $26 \div \square = 2$

4. Write the mathematical expressions in words.

a)  $(5 + 3) \times 4$  \_\_\_\_\_

b)  $2 + (7 \times 3)$  \_\_\_\_\_

c)  $9 \div (4 + 2)$  \_\_\_\_\_

5. Replace the variable with the given number and evaluate.

a)  $(n + 4) \times 2$ ,  $n = 3$

b)  $3 + (t \times 2)$ ,  $t = 4$

c)  $6 \div (w - 5)$ ,  $w = 8$

6. Circle the part that is larger. Write the difference two ways to make an equation. Then solve the equation.

a) 8 games

6 books

x fewer books than games

b) x pens

3 more pencils than pens

5 pencils

c) 7 apples

4 fewer oranges than apples

x oranges

# Unit 8: Patterns and Algebra

Answer Key

## Quiz (Lessons 8–12) — ON

1. a) 20  
b) 14  
c) 2

2. a) 7  
b) 13

**BONUS**

15

3. a)  $\square = 12 \div 4$   
 $\square = 3$   
b)  $\square = 9 + 8$   
 $\square = 17$

**BONUS**

$\square = 26 \div 2$ ,  $\square = 13$

4. a) Add 5 and 3. Then multiply by 4.  
b) 2 more than the product of 7 and 3.  
c) 9 divided by the sum of 4 and 2.

5. a)  $(3 + 4) \times 2$   
 $= 7 \times 2$   
 $= 14$

- b)  $3 + (4 \times 2)$   
 $= 3 + 8$   
 $= 11$

- c)  $6 \div (8 - 5)$   
 $= 6 \div 3$   
 $= 2$

6. a) circle games  
 $8 - 6 = x$   
 $x = 2$

- b) circle pencils  
 $5 - 3 = x$   
 $x = 2$

- c) circle apples  
 $7 - 4 = x$   
 $x = 3$

## Unit 8: Patterns and Algebra

Name: \_\_\_\_\_

### Quiz (Lessons 13–16) — ON

Date: \_\_\_\_\_

1. Write the parts and how much each part costs. Then write and solve an equation.

A pen costs \$9 and a pencil is \$5 cheaper than the pen.

a) How much does the pencil cost?

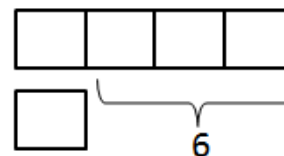
b) How much do the pen and pencil cost altogether?

2. Write an equation to solve the problem.

Ella read 23 pages on Monday. She read 6 pages in the morning.

How many pages did she read in the afternoon?

3. Sara is 4 times as old as her brother. Sara is 6 years older than her brother. Finish the model to find out how old Sara is.



4. Draw a model for the story. Then solve the problem.

There are 42 people on a school bus.

There are five times as many children as there are adults.

How many children and how many adults are on the bus?

5. Write an equation to solve the problem.

Amit is twice as old as John. Clara is 3 years older than John. John is 11 years old.

a) How old is Amit?

b) How old is Clara?

**BONUS** ► Phil collects quarters, dimes, and nickels. He has 40 coins in his collection.

He has 18 quarters and 15 dimes. How many more dimes than nickels does Phil have?

## Unit 8: Patterns and Algebra

Answer Key

### Quiz (Lessons 13–16) — ON

1. a) pen: \$9  
pencil:  $x$   
difference: \$5  
 $9 - 5 = x$   
 $x = 4$   
The pencil costs \$4.
- b) pen: \$9  
pencil: \$4  
total:  $x$   
 $x = 9 + 4$   
 $x = 13$   
The pen and pencil  
cost \$13 altogether.
2.  $x = 23 - 6$   
 $x = 17$   
Ella read 17 pages in  
the afternoon.
3. Teacher to check diagram.  
Sara is 8 years old.
4. Teacher to check diagram.  
There are 35 children and  
7 adults on the bus.
5. a)  $a = 2 \times 11$   
 $a = 22$   
Amit is 22 years old.
- b)  $c = 11 + 3$   
 $c = 14$   
Clara is 14 years old.

#### BONUS

$n + 15 + 18 = 40$   
 $n = 7$   
 $15 - 7 = 8$   
Phil has 8 more dimes  
than nickels.

# Unit 8: Patterns and Algebra

## Test (Lessons 9–16) — ON

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. Solve the equation.

a)  $w + 7 = 26$

b)  $b \times 3 = 27$

$w =$  \_\_\_\_\_

$b =$  \_\_\_\_\_

2. Write an equation that tells you the relationship between the numbers in Column A and Column B.

a)

| A | B  |
|---|----|
| 1 | 7  |
| 2 | 14 |
| 3 | 21 |

b)

| A | B  |
|---|----|
| 1 | 9  |
| 2 | 10 |
| 3 | 11 |

3. Let  $b$  stand for the number of apples in each bag. Write an equation to find  $b$ .

- a) 19 apples in total



Equation: \_\_\_\_\_

\_\_\_\_\_ apples in each bag

- b) 15 apples in total



Equation: \_\_\_\_\_

\_\_\_\_\_ apples in each bag

4. Write the mathematical expressions in words.

a)  $(3 + 1) \times 5$  \_\_\_\_\_

b)  $13 - 4 \times 3$  \_\_\_\_\_

5. Replace the variable with the given number, then evaluate.

a)  $2h - 5$ ,  $h = 3$

b)  $3x + 7$ ,  $x = 6$

c)  $9 - 4n$ ,  $n = 2$

**BONUS** ► Anna wants to buy a new MP3-player that costs \$35. Anna has already saved \$7. Anna decides to save equal amounts of money each month for the next four months. Write an expression to show the amount of money that she has to save each month.

## Unit 8: Patterns and Algebra

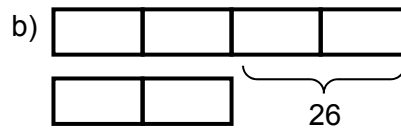
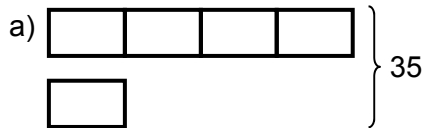
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### Test (Lessons 9–16) — ON

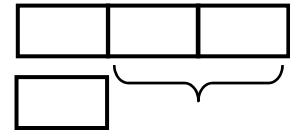
6. Write and solve the equation for the problem.

There are 14 red cars. There are 7 fewer red cars than blue cars.  
How many blue cars are there?

7. What is the size of each block?



8. Megan is 3 times as old as her brother. Megan is 8 years older than her brother. Finish the model to find out how old Megan is.



9. An apple slicer cuts apples into 6 equal pieces. There are 4 apples and 8 people sharing the apples. Each person gets the same number of pieces. How many pieces of apple does each person get?
10. There are twice as many orange pens as red pens. There are 8 more black pens than red pens. There are 4 red pens. How many pens are there altogether?

**BONUS►** Amy is arranging floor tiles. She uses 6 red tiles. There are 10 fewer red tiles than blue tiles and twice as many white tiles as the sum of red and blue tiles.

a) How many tiles of each colour does Amy use?

b) How many tiles does she use in total?

# Unit 8: Patterns and Algebra

## Test (Lessons 9–16) — ON

1. a)  $w = 15$   
b)  $b = 15$
2. a)  $B = 3A$   
a)  $B = A + 8$
3. a)  $3b + 1 = 19$   
 $b = 6$   
b)  $3b + 3 = 15$   
 $b = 4$
4. a) five times the sum of three and one  
b) thirteen minus the product of 4 and 3
5. a)  $2(3) - 5$   
 $= 6 - 5$   
 $= 1$   
b)  $3(6) + 7$   
 $= 18 + 7$   
 $= 25$   
c)  $9 - 4(2)$   
 $= 9 - 8$   
 $= 1$

### BONUS

- $(35 - 7) \div 4$
6.  $b - 14 = 7$   
 $b = 14 + 7$   
 $b = 21$
  7. a) 7  
b) 13
  8. In the diagram, the bracket represents 8, and each block represents 4.  
Megan is 8 years old.
  9.  $4 \times 6 = 24$   
 $24 \div 8 = 3$   
Each person gets 3 pieces.
  10.  $r = 4$   
 $b = 4 + 8 = 12$   
 $o = 2 \times 4 = 8$   
 $4 + 12 + 8$   
 $= 24$  pens altogether

### BONUS

- a)  $r = 6$   
 $b = 6 + 10 = 16$   
 $r + b = 22$   
 $w = 22 \times 2 = 44$
- b)  $6 + 16 + 44$   
 $= 66$  tiles in total