

Unit 7: Patterns and Relations

Quiz (Lessons 10, 12–14)

Name: _____

Date: _____

1. Complete the table. (12 marks)

Expression	Variable Term	Variable	Coefficient	Constant Term
$24x - 9$				
$97 - 23T$				
$-k + 18$				

2. Solve for the variable by guessing and checking. Use the table. (12 marks)

a) $5x + 28 = 43$

x	$5x + 28$	True?
1		
2		
3		
4		
5		

so $x =$ _____

b) $25m - 30 = 95$

m	$25m - 30$	True?
1		
2		
3		
4		
5		

so $m =$ _____

3. The scales are balanced. Let m represent the number of apples in the bag. Write an equation to represent the total number of apples on each side of the balance. (8 marks)





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continued

Quiz (Lessons 10, 12–14)

4. Write the operation and number that make the equation true. (6 + 2 marks)

a) $49 + 8 \underline{\hspace{1cm}} = 49$

b) $85 \div 5 \underline{\hspace{1cm}} = 85$

c) $26 - 50 \underline{\hspace{1cm}} = 26$

Bonus► $(13 + 54m - 96y) \times 31 \underline{\hspace{1cm}} = 13 + 54m - 96y$

5. Isolate the variable by applying the opposite operation. Remember to apply the same operation on both sides of the equation. (8 marks)

a) $z - 24 = 26$

b) $96 = 12b$

6. Check your solutions to Question 5 by substituting your solution into the original equation. (8 marks)

a) $LS = z - 24$ $RS = 26$
 $LS =$

b) $LS = 96$ $RS =$

/54 + 2 marks

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Quiz (Lessons 10, 12–14)

1. $24x$, x , 24 , -9
 $-23T$, T , -23 , $+97$
 $-k$, k , -1 , $+18$
2. Teacher to check tables.
 - a) $x = 3$
 - b) $m = 5$
3.
 - a) $m + 4 = 7$
 - b) $8 = 2m$
4.
 - a) -8
 - b) $\times 5$
 - c) $+50$

Bonus

- $\div 31$
5.
 - a) $z - 24 + 24 = 26 + 24$
 $z = 50$
 - b) $96 \div 12 = 12b \div 12$
 $8 = b$
6. Teacher to check.

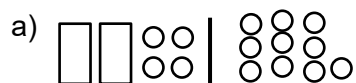
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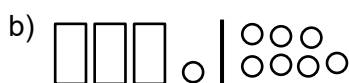
Name: _____

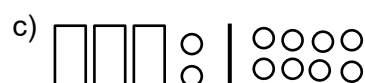
Quiz (Lessons 15–18)

Date: _____

1. The circles represent apples, the rectangles represent bags with the same unknown number of apples, and the line divides two sides of a balance. Write the equation shown by the picture. Use b for the unknown number of apples in each bag. (6 marks)

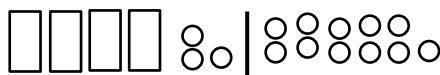






2. Solve the equation by using a model. Draw the new model and equation for each step of your solution. (12 marks)

$$4x + 3 = 11$$



$$4x + 3 - 3 = 11 - 3$$



3. Solve the equation by applying opposite operations. Show each step. (15 marks)

a) $9r - 12 = 87$

b) $\frac{5t}{6} = 10$

c) $48 + 2x = 100$

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continued

Quiz (Lessons 15–18)

4. Solve the equation. Show your work. (10 marks)

a) $s + (-18) = -29$

b) $w - (-42) = -8$

c) $-2 + q - (+8) = -73 + (+2)$

5. Translate the sentence into an equation. Solve the equation to find the number. (7 + 10 marks)

a) A number multiplied by 5 then increased by 8 is 43.

Bonus► A number multiplied by seven then decreased by twenty is ten more than the product of eleven and three.

/50 + 10 marks

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Answer Key

Quiz (Lessons 15–18)

1. a) $2b + 4 = 10$
 b) $3b + 1 = 7$
 c) $3b + 2 = 8$
2. Teacher to check steps
 and model.
 $x = 2$
3. a) $r = 11$
 b) $t = 12$
 c) $x = 26$
4. a) $s = -11$
 b) $w = -50$
 c) $q = -61$
5. a) $5x + 8 = 43$
 $x = 7$

Bonus

$$7n - 20 = 11 \times 3 + 10$$
$$n = 9$$

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Test (Lessons 10, 12–18)

Name: _____

Date: _____

1. Explain how equations and expressions are similar and how they are different. (4 marks)

2. Explain what the solution to an equation means. (2 marks)

3. Solve for x by guessing, checking, and revising. Use test values between 0 and 10. (4 marks)

$$14x + 17 = 143$$

4. Isolate the variable by applying the opposite operation. Remember to apply the same operation on both sides of the equation. (8 marks)

a) $t - 27 = 112$

b) $180 = 9b$

5. Check your solutions to Question 4 by substituting your solution into the original equation. (8 marks)

a) $LS = t - 27$ $RS = 112$

b) $LS =$ $RS =$

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continued

Test (Lessons 10, 12–18)

6. The circles represent apples, the rectangles represent bags with the same unknown number of apples, and the line divides two sides of a balance. Solve the equation by using a model. Draw the new model and equation for each step of your solution. (12 marks)

$$3x + 2 = 14$$



$$3x + 2 - 2 = 14 - \underline{\hspace{2cm}}$$



7. Solve the equation by applying opposite operations. Describe each step in words. (12 marks)

a) $3x + 19 = 40$

b) $\frac{n}{7} = 25$

8. Solve the equation. Show your work. (10 + 5 points)

a) $w - (-12) = -35$

b) $x - (+25) = -65$

c) $-5 + (-9) = -41 - (+7) + q$

Bonus ► $(-55) - 4 + r - (-16) = -400 - (-20) - (+45)$

9. Mariko's dad is four times as old as she is, and 11 years younger than Mariko's aunt. Mariko's aunt is 59. How old is Mariko? (8 marks)

/68 + 5 marks

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Test (Lessons 10, 12–18)

1. Answers may vary. Teacher to check.
2. A solution to an equation is a value for the variable that makes the equation true.
3. $x = 9$
4. a) $t = 139$
b) $20 = b$
5. Teacher to check.
6. Teacher to check steps and model.
 $x = 4$
7. a) $3x + 19 - 19 = 40 - 19$
subtract 19
 $3x = 21$
simplify
 $3x \div 3 = 21 \div 3$
divide by 3
 $x = 7$
simplify
b) $\frac{n}{7} \times 7 = 25 \times 7$
multiply by 7
 $n = 175$
simplify
8. a) $w = -47$
b) $x = -40$
c) $+34 = q$ or $q = 34$

Bonus

- $r = -382$
9. Mariko is 12.