Fifth Grade
Answer Key
Unit 7: Algebraic Reasoning

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Problem of the Day

Lesson 1
Draw two different rectangles that each have an area of 24 square units.

Answers will vary.

Lesson 3
On Monday, Riana went to a local orchard and bought 2 pounds of apples. She liked the apples so much that she went back to the orchard on Wednesday and bought 4 more pounds of apples. The orchard sells apples for $3 per pound. How much did Riana pay in all for the apples?

$18

Lesson 4
Greenfield Elementary School has three fifth grade classes. Two of the classes each have 24 students and the third class has 21 students. How many fifth-grade students are in Greenfield Elementary?

69 students

Lesson 2
Which of the following numbers are divisible by 3? Choose all that apply.

A. 12
B. 16
C. 21
D. 33
E. 35

Lesson 5
Find the product.

$3 \times 0.5 =$ **1.5**

Find the quotient.

$3 \div 0.5 =$ **6**

Problem of the Day

Lesson 6
Find the value of each expression.

$\frac{3}{4} + \frac{2}{5}$ **$\frac{23}{20}$** $\frac{3}{4} - \frac{2}{5}$ **$\frac{7}{20}$**

$\frac{3}{4} \times \frac{1}{4}$ **$\frac{3}{16}$** $3 \div \frac{1}{4}$ **12**

Lesson 7
Find the value of each expression.

25 + 18 + 55   **98**

125 − 19 − 88   **18**

5 × 6 × 29   **870**

88 ÷ 2 ÷ 11   **4**

Lesson 8
Ali has 5 boxes. Each box is filled with 13 books. Keno has 13 boxes. Each box is filled with 5 books. Who has more books in all, Ali or Keno? Explain.

Sample answer: They have the same number of books because 13 × 5 = 5 × 13.

Lesson 9
Write the operation associated with each term.

Sum **addition** _____

Product **multiplication** _____

Difference **subtraction** _____

Quotient **division** _____

Lesson 10
What is 4 times as many as 10?

40

What is 14 times as many as 50?

700

Problem of the Day

Lesson 11

Write the missing number in each equation.

69 ____ + 59 = 128

32 × ____ **3** = 96

Lesson 13

Use numbers and symbols to write each expression.

The sum of 12 and 15   **12 + 15 = 27**

The product of 8 and 9   **8 × 9 = 72**

19 subtracted from 22   **22 – 19 = 3**

60 divided by 15   **60 ÷ 15 = 4**

Lesson 12

Tavon bought 4 packages of trading cards. There were 8 cards in each package.

How many cards did Tavon buy in all?

32 cards

Tavon gave $\frac{1}{4}$ of the cards to his sister. How many cards did he give to his sister?

8 cards

Lesson 14

What pattern do you notice in the list of numbers below?

8, 11, 14, 17…

Write the next 3 terms in the pattern.

20, 23, 26

Lesson 15

Use the rule to write the first 5 terms of the pattern.

Add 10 starting with 5.

5, 15, 25, 35, 45

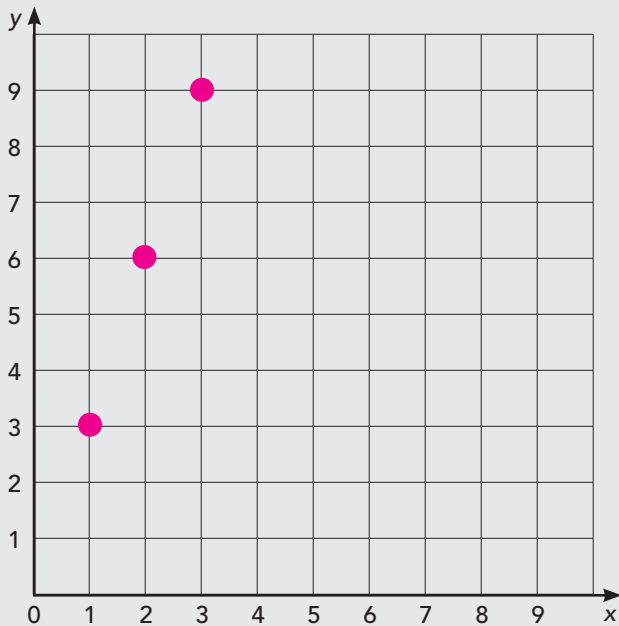What do you notice about the terms in the pattern?

Sample answer: Each number is 10 more than the number before it.

Problem of the Day

Lesson 16

Plot the following coordinates.

(1, 3), (2, 6), (3, 9)

Lesson 17

Complete the input/output table.

Input	Output
3	8
5	**9**
7	12
9	14
12	16

Lesson 18

What is the rule for the pattern shown below?

0, 5, 10, 15, 20…

Add 5

What is the rule for the pattern shown below?

5, 25, 125, 625, 3125

Multiply by 5

Lesson 19

Find the value of each expression:

$12 + 4 \times 6$ **36**

$(12 + 4) \times 6$ **96**

Lesson 20

Use the numbers 3, 5, and 15 to create an expression with a value of 10.

15 ÷ 3 + 5 = 10

Pre-Assessment

1. List all the factor pairs of 44.

(1, 4) (2, 22) (4, 11)

2. Which of the following numbers is prime? Choose all that apply.

A. 13

B. 21

C. 27

D. 33

E. 41

Find the value of each expression.

3. $4 + 6 \div 2$

7

4. $3 + (5 - 2) \times 4$

15

5. $2 + 4 \times \frac{1}{6}$

$2\frac{4}{6}$

6. $4.5 - (12 - 8) \times 0.25$

3.5

7. Apply the Commutative Property to create a new expression.

$152 + 19 + 86$

86 + 19 + 152

8. Use numbers and symbols to write the expression.

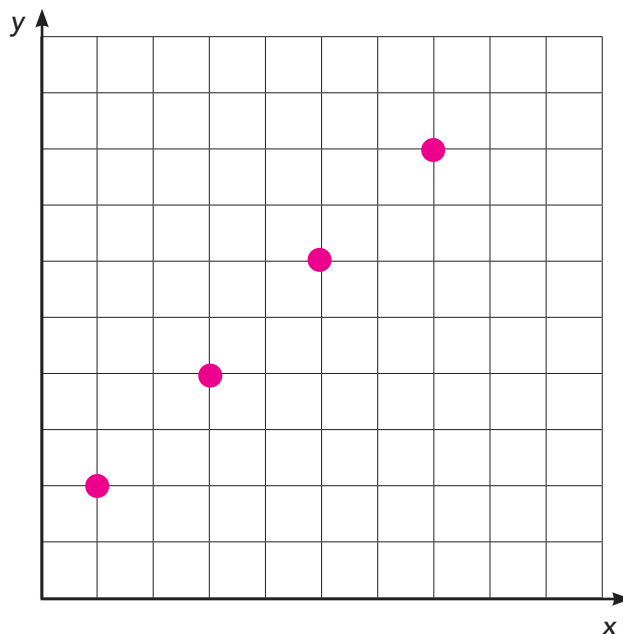12 times as many as the sum of 52 and 19

12 × (52 + 19)

9. Use the rules to write the first 5 terms of each pattern. What relationship do you see between the terms of the patterns?

Add 2, starting with 0. **0, 2, 4, 6, 8**

Add 4, starting with 0. **0, 4, 8, 12, 16**

10. Use the equation $y = x + 1$ to create pairs of points. Graph the points on the coordinate plane.

x	y
1	2
3	4
5	6
7	8

Order of Operations Quiz

1. List all the factor pairs of 28.

(1, 28), (2, 14), (4, 7)

2. Which of the following numbers is prime? Choose all that apply.
   A. 1
   B. 19
   C. 41
   D. 39
   E. 67

Find the value of each expression.

3. $5 + 8 \div 4$

7

4. $3 + (5 - 2) \times 4$

15

5. $3.2 + 6 \div 0.2$

33.2

6. $6 \div (0.2 + 0.3) - 8.2$

3.8

7. $\dfrac{5}{6} - \dfrac{1}{2} + \dfrac{1}{3}$

0

8. $\left(\dfrac{1}{4} + \dfrac{2}{3}\right) \times \dfrac{4}{5}$

$\dfrac{44}{60}$

9. Add parentheses to the expression $5 + 2 \times 7 - 4$ so that the value of the expression is 11.

$5 + 2 \times (7 - 4)$

10. Do the expressions $10 - 3 \times 2$ and $(10 - 3) \times 2$ have the same value? Explain why or why not.

Sample answer: No. When you add the parentheses, it changes the expression.

Expressions Quiz

Use the Commutative Property to rewrite each expression. Then, find the value of the expression.

1. $37 + 54 + 13$

Sample answer:
$37 + 13 + 54 = 104$

2. $8 \times 7 \times 5$

Sample answer:
$5 \times 7 \times 8 = 280$

Use the Associative Property to rewrite each expression. Then, find the value of the expression.

3. $79 + 35 + 15$

Sample answer:
$79 + 35 + 15 = 15 + 35 + 29$
$129 = 129$

4. $48 + 29 + 31$

Sample answer:
$48 + 29 + 21 = 31 + 29 + 48$
$98 = 98$

Use numbers and symbols to record each expression.

5. subtract 2 from 5, then add 8
$(5 - 2) + 8 = 11$

6. add 5 and 2, then multiply by 8
$(5 + 2) \times 8 = 56$

7. 8 times as many as 2 plus 5
$8 \times (2 + 5) = 80$

8. divide 8 by 2, then add 5
$8 \div 2 + 5 = 9$

9. Use numbers, symbols, and/or variables to write the expression.
add d and 9, then multiply by 4
$(d + 9) \times 4$

10. AJ buys 13 packages of glow-necklaces for a party. Each package has 6 necklaces. In each package, $\frac{2}{3}$ of the necklaces are yellow. How many yellow necklaces does AJ buy?
52 yellow necklaces

Number Patterns Quiz

1. Write the first five terms of each pattern.

   Add 3, starting at 0.

   __0__, __3__, __6__, __9__, __12__

   Add 3, starting at 5.

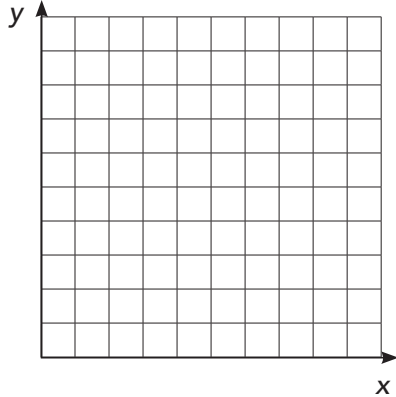   __5__, __8__, __11__, __14__, __17__

2. What relationship do you see between the terms in the two patterns from question 1?

   Sample answer: Each bottom number is 5 larger than the number above it.

3. Use the patterns from question 1 to create ordered pairs.

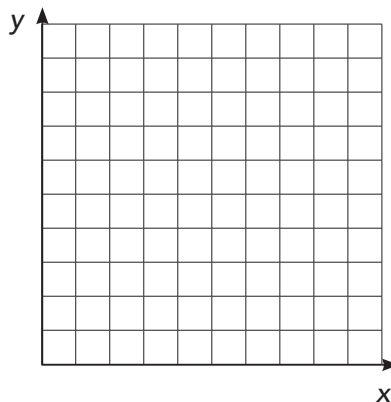   **(0,5), (3, 8), (6, 11), (9, 14), (12, 17)**

4. Graph the ordered pairs you created in question 3.

   Answers will vary.

5. Use the equation $y = 3x$ to create four ordered pairs. Graph the pairs on the grid.

x	y
1	3
2	6
3	9
4	12

Assessment

1. List all the factor pairs of 36.

(1, 36), (2, 18), (3, 12), (4, 9), (6, 6)

2. Which of the following numbers is prime? Choose all that apply.

A. 19

B. 23

C. 35

D. 43

E. 63

Find the value of each expression.

3. $12 + 8 \div 4$

14

4. $18 + (9 - 5) \times 9$

54

5. $\frac{3}{4} + \frac{1}{2} \times \frac{1}{6}$

$\frac{10}{12}$

6. $10.5 - (20 - 15) \times 0.2$

9.5

7. Apply the Commutative Property to create a new expression.
Show how to find the value of the new expression.

$152 + 19 + 86$

19 + 86 + 152 = 257

8. Apply the Associative Property to create a new expression.
Show how to find the value of the new expression.

$14 \times 15 \times 4$ **= 4 × 15 × 14**

840 = 840

Use numbers and symbols to write each expression.

9. 12 times as many as the sum of 52 and 19

12 × (52 + 19)

10. add 6 and 7, then multiply by 10

(6 + 7) × 10

11. subtract 6 from 10, then divide by 2

(10 − 6) ÷ 2

12. divide 50 by the product of 25 and 2

50 ÷ (25 × 2)

13. Write an expression that will have a value that is 13 times as many as the value of the expression (6 + 8).

13 × (6 + 8)

14. Use the rules to write the first five terms of each pattern.

Add 3, starting with 1.

1 , **4** , **7** , **10** , **13**

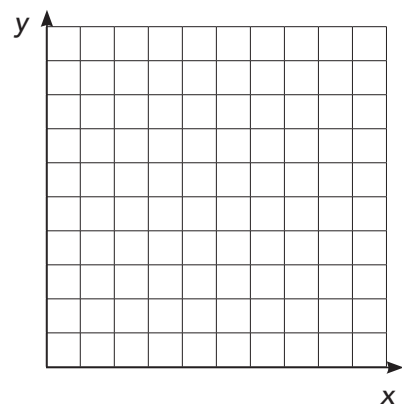Add 3, starting with 2.

2 , **5** , **8** , **11** , **14**

15. Describe the relationship between the terms of the patterns in question 14.

Sample answer: The bottom number is one more than the top number.

16. Use the terms in the patterns from question 14 to create ordered pairs.

(1, 2), (4, 5), (7, 8), (10, 11), (13, 14)
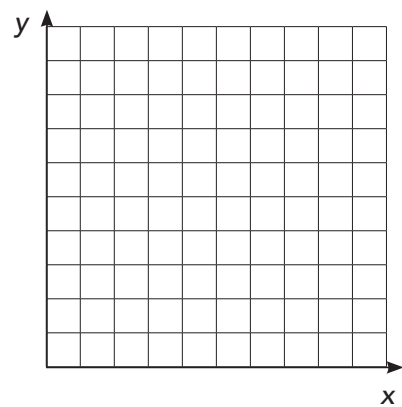
17. Graph the ordered pairs from question 16.

Answers will vary.

18. Use the equation $y = 10x$ to create ordered pairs.

x	y
1	**10**
2	**20**
3	**30**
4	**40**

19. Graph the ordered pairs from question 18.

Answers will vary.

20. Elise needs to serve her dog 781 kilocalories of dog food each day. Each cup of dog food contains 347 calories. How many cups of food will Elise give her dog in 5 days?

11.25 cups

$$3 \times 5 + 1 \div 8$$

15.13

Order of Operations Cards

$$6 \times 4 - 7$$

17

$$9 - 7 + 6$$

-4

$$28 - 4 + 3 \times 2$$

12

$$8 + 9 \times 5$$

53

$$54 \div 9 \times 2 + 15$$

18

$$3 + 6 - 10 \div 2$$

4

$$16 \times 2 \div 4 + 3 \times 5$$

23

$$3.5 \times 2 + 8 \div 0.4$$

27

$$6.5 \times 4.1 - 7.12$$

19.53

Decimal Cards

$$9.6 - (7.3 + 1.04)$$

1.26

$$28 - (4.2 + 3) \times 2$$

13.6

$$80.12 + 9.8 \times 5$$

129.12

$$54 \div 0.9 \times 2.14$$

27.98

$$3.2 + 6.4 - 0.6 \div 2$$

9.3

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Decimal Cards

$$1.6 \times (2 + 3.3) \times 5.1$$

29.38

add 12 and *b*, then divide by 5

(12 + *b*) ÷ 5

add 6 and 4, then multiply by *d*

(6 + 4) × *d*

Variable Expressions Cards

divide 8 by *n*, then add 5

$8 \div n + 5$

4 more than 10 times as many as *r*

$$4 + 10 \times r$$

subtract *t* from 5,
then add 15

(5 − *t*) + 15

add *g* to the product of 10 and 4

$$g + 10 \times 4$$

c times as many as the difference of 5 and 2

$c \times (5 - 2)$

4 times as many as z plus 6

$$4 \times (z + 6)$$

subtract the quotient of 8 and 2 from *h*

$8 \div 2 - h$

add *k* and 5, then multiply by 6

(*k* + 5) × 6

8 times as many as
m plus 5

$8 \times (m + 5)$

add *y* to the product of 2 and 5

$2 \times 5 + y$

The principal bought 23 boxes of pens. Each box of pens has 14 blue pens and 26 black pens. How many pens did the principal buy in all?

920 pens

Raul made cookies for the school bake sale. He made 45 chocolate chip cookies and 60 oatmeal raisin cookies. He is putting the cookies into bags of 5 cookies each. How many bags of cookies can he make?

21 bags

Ashley mixed 4.5 pints of raspberries and 3.5 pints of blueberries in a serving bowl. Then she spooned 0.5 pint of berries into each dessert dish. How many dessert dishes does Ashley fill?

16 dessert dishes

The Miller family bought 6 pizzas for a party. Each pizza had 12 slices. After the party, there were 13 slices remaining. How many slices of pizza were eaten during the party?

59 slices of pizza

Thomas runs 3.2 miles each weekday and 5.4 miles each weekend day. How many miles does he run in one week?

26.8 miles

Story Cards

Yasmin is sending a box of 13 books to her cousin. Each book weighs $\frac{3}{4}$ pound and the box and packaging weigh an additional $1\frac{1}{2}$ pounds. What is the total weight of the package that Yasmin is sending?

$11\frac{1}{4}$ pounds

Tia earns $5.25 an hour for babysitting. Tia was paid for 4 hours of babysitting. On her way home, she stopped and bought ice cream using the money she earned. After buying the ice cream, she had $18.24 remaining. How much money did she spend on ice cream?

$2.76

Add 5, starting at 0.

0, 5, 10, 15

Add 10, starting at 0.

0, 10, 20, 30

Add 3, starting at 0.

0, 3, 6, 9

Add 6, starting at 0.

0, 6, 12, 18

Add 2, starting at 0.

0, 2, 4, 6

Add 8, starting at 0.

0, 8, 16, 24

Add 2, starting at 3.

3, 5, 7, 9

Add 2, starting at 5.

5, 7, 9, 11

Add 5, starting at 5.

5, 10, 15, 20

Add 5, starting at 10.

10, 15, 20, 25

Multiply by 2, starting at 2.

2, 4, 8, 16

Multiply by 2, starting at 4.

4, 8, 16, 32

Which number has more factor pairs? Explain.

60

90

Sample answer:
60 and 90 share similar factors, but 90 is a larger number and has more factors.

List five prime numbers and five composite numbers.

Sample answers:

Prime	Composite
1, 3, 5, 7, 11	4, 6, 8, 9, 10

Math Hunt Cards

Find the value of the expression.

80 ÷ 2 + (18 − 8)

14

How would the value of the expression change if the parentheses were removed?

Sample answer: The answer would be 14.

Find the value of the expression.

$$\frac{2}{3} + \frac{1}{3} \times \frac{2}{4} \qquad \frac{10}{12}$$

Use numbers and symbols to write expressions for each statement.

Add 3 to the product of 4 and 7.

$$3 + 4 \times 7$$

Add 3 and 4. Then multiply by 7.

$$(3 + 4) \times 7$$

Math Hunt Cards

Write an expression to represent the problem. Then use the expression to solve the problem.

Eva buys 8 packages of identical marbles. The total weight of all the packages is 144 ounces. If there are 6 marbles in each package, what is the weight of each marble?

$$144 \div (8 \times 6) = 3 \text{ ounces}$$

Which pairs of equations have the same value? Which pairs do not? Explain.

$39 + 12 + 18 \qquad 39 + (12 + 18)$	**same value**

$35 - 16 - 10 \qquad 35 - (16 - 10)$	**same value**

$6 \times 42 \times 5 \qquad 6 \times 5 \times 42$	**same value**

$54 \div 9 \div 3 \qquad 9 \div 54 \div 3$	**different value**

Sample answer: The parenthesis change the values of the equations.

Write the first five terms of each pattern.

Add 6, starting at 0.

_0_ , _6_ , _12_ , _18_ , _24_

Add 2, starting at 0.

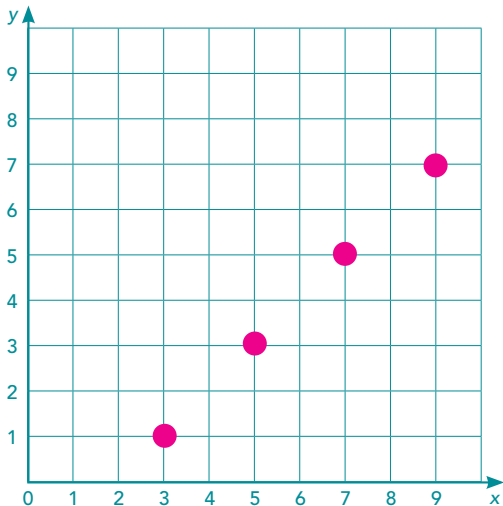_0_ , _2_ , _4_ , _6_ , _8_

What relationship exists between the terms?
Sample answer: The top numbers are 3 times
the size of the bottom numbers.

Use the patterns below to create ordered pairs. Graph the ordered pairs.

3, 5, 7, 9
1, 3, 5, 7

**(3, 1), (5, 3),
(7, 5), (9, 7)**

Use the equation $y = 6x$ to complete the table.

x	y
1	**6**
2	**12**
3	**18**
4	**24**

Find the value of the expression.

(5.2 – 2.2) ÷ 0.2   **15**

How does the value of the expression 4 × (16 + 48) compare to the value of the expression 16 + 48?

Sample answer:
The first equation is 4 times as much as the value of the second equation.