Rising Algebra I

Students

Summer Skills

Workbook

June 2018

Name_____

This booklet is a review of the main middle school mathematical concepts. You should complete each page. Pages 1 through 15 have the answers at the bottom. Please place the number of each problem in the space that matches the answer.

Turn this booklet in the first Day back to school.

Please be sure to not
use the calculator
when you see this symbol.

Use the variable n for the following. Translate each statement into an expression.

1) a number increased by four
2) four times a number decreased by seven
3) the quotient of a number and seven
4) four less than a number
5) four times the quantity of a number minus seven
6) the square of a number diminished by seven
7) the sum of the squares of a number and four
8) the square of the sum of a number and four
9) the product of a number and four
10) the difference of four and a number
11) four more than a number divided by seven
12) the ratio of four and seven
13) four divided by a number
14) four divided into a number
15) twice a number
16) four more than seven times a number

Place the number to the correct answer for questions 1 through 16 in the box below.

4 + 7n	4n	$\frac{n}{4}$	$(n+4)^2$	2n	4 - n	$4+\frac{n}{7}$	$\frac{n}{7}$
$\frac{4}{n}$	n^2-7	n - 4	$\frac{4}{7}$	4n - 7	n^2+4^2	n+4	4(n - 7)

Evaluate the following when x = 4, y = -2, and z = 5. Show all work.

Evaluate means to substitute the value in for each variable and simplify the expression.

1) $3x - y$

2) $xy + z$

3) $4x - 3z$

4) xyz

5) $x - 2y + 3z$

6) $x(y - 2z)$

7) $x^2 - y^2$

8) $\frac{1}{2}x + y^2$

9) $\frac{x - y}{-3}$

10) $|xy|$

11) $|z + x|$

12) $|2z| + |3y|$

Place the number to the correct answer for questions 1 through 12 in the box below.

14	12	-3	6	1	-2	-40	8	23	9	-48	16

Use the Distributive Property to simplify the following:

1) 4(x + 2)

2) 5(2x – 3)

3) -3(x – 4)

4) $\frac{1}{2}(4x-12)$

5) 3(2x – 3y)

6) 7(5 – 2x)

7) 3(x – 2) + 4(x – 3)

8) 5(x + 8) – (x – 2)

9) 8 – 3(x + 5)

10) 5 + 2(3x – 4)

11) 4x + 3(2x + 8)

12) -3(x + 4) + 9

13) 2(x – 5) + 3(x + 6)

14) $\frac{1}{3}(6x-9y+12)$

15) 0.7(3x – 10)

16) 2x – 5(x – 3y)

17) 5 + 3(x + 2) – 2x

18) 1.l(2x – 3y)

Place the number to the correct answer for questions 1 through 18 in the box below.

-3x + 12	**4x + 42**	**5x + 8**	**10x + 24**	**4x + 8**	**-3x – 7**	**2x – 3y + 4**	**x + 11**	**10x - 15**
-3x + 15y	**2x – 6**	**6x - 3**	**6x – 9y**	**2.1x – 7**	**-3x - 3**	**35 – 14x**	**2.2x – 3.3y**	**7x – 18**

Simplify the following by combining like terms. Like terms have the same variable and exponent. These terms can be combined with addition and subtraction without changing the exponent of each term.

1) 5x – 3x

2) 4y – 7y

3) $3x^2 + 4x^2$

4) 5x – 3y – x + 7

5) 7y – 12 – 3y

6) 2n – 4 + 3n + 8

7) 5y + 3x – 2z – 3y + 6x + 8x

8) 4(x – 2) – 3(x + 7)

9) 4 – 3(x – 5) + 2x

10) $x^2 + 3x + 2x^2 - 8 + 4x$

11) $10x^2 - 5x^2$

12) $4x^2 - 5y^2 + 3x^2 - 7y^2$

13) 5(x – 2y + 3) – 2(2y + 3x + 7)

14) $4x^2 - 2x - 4x^2 + 3x - 29$

Place the number to the correct answer for questions 1 through 14 in the box below.

-x + 19	5n + 4	$7x^2 - 12y^2$	2x	17x + 2y – 2z	x - 29	$3x^2 + 7x - 8$
x - 29	-3y	4y -12	$7x^2$	-x – 14y + 1	$5x^2$	4x - 3y + 7

Probability

A) A number is chosen at random from {2, 4, 6, … 80}

1) How many numbers are in this set? _____

2) What is the probability that it is evenly divisible by 5? _____

3) What is the probability that it is even? _____

4) What is the probability that it is odd? _____

B) A box contains 5 red balls, 4 green balls, and 2 white balls. A ball is drawn at random from the box. Answer each of the following:

5) What is the total number of balls in the box? _____

6) P (red) _____ 7) P (green) _____ 8) P (white) _____

9) P (green or white) _____ 10) P (red or white) _____

C) A card is chosen at random from a deck of 52.

11) What is the probability it will be a club? _____

12) What is the probability it will be a king? _____

13) What is the probability it will be either a king or a queen? _____

14) What is the probability of a face card (jack, queen, or king)? _____

Place the number to the correct answer for questions 1 through 14 in the box below.

0	$\frac{1}{5}$	$\frac{4}{11}$	$\frac{1}{4}$	11	$\frac{6}{11}$	$\frac{1}{13}$	40	$\frac{7}{11}$	$\frac{5}{11}$	$\frac{3}{13}$	$\frac{2}{13}$	$\frac{2}{11}$	1

Use order of operations (PEMDAS) to simplify the following.

1) 8 + 6 – 3

2) 15 – (7 – 2) – 3

3) 5(4) – 10

4) 24 – 21 ÷ 3

5) 18 – 12 ÷ 4

6) 12 – (4 + 7)

7) 7(3 + 4)

8) 12 ÷ 3 · 4

9) (11 + 4) ÷ 5

10) (12 · 4) ÷ (2 · 2)

11) 30 ÷ 6 – 1

12) 42 ÷ (5 + 2) · 3

13) 4 + 3(7 – 2)

14) 5(6 – 8)

15) 15 – 2(8 + 3)

16) 2 – 8 ÷ 4

17) 4 – 8 + 6

18) 10 - 3(4)

Place the number to the correct answer for questions 1 through 18 in the box below.

11	16	-10	7	3	-7	10	12	17	-2	15	1	18	2	4	0	49	19

Write <, >, or = for each or the following.

1) $\frac{7}{10}$ □ $\frac{3}{10}$

2) $\frac{5}{16}$ □ $\frac{3}{4}$

3) $\frac{2}{8}$ □ $\frac{1}{4}$

4) $\frac{-7}{8}$ □ $\frac{-8}{9}$

5) $\frac{-11}{24}$ □ $\frac{-5}{8}$

6) $\frac{7}{5}$ □ $\frac{6}{4}$

7) $\frac{-8}{12}$ □ $\frac{-4}{6}$

8) $\frac{-3}{4}$ □ $\frac{-9}{12}$

9) $\frac{2}{3}$ □ $\frac{-3}{4}$

10) $\frac{-7}{4}$ □ $\frac{-5}{3}$

11) -12 □ -11

12) $|-3|$ □ $|3|$

13) -11 □ -2

14) 0.437 □ 0.435

15) -0.57 □ -0.570

List the problem numbers in smallest to largest order for the correct answer.

<					
>					
=					

A number is expressed in scientific notation if it is written as a number between 1 and 10 multiplied by a power of 10. For example, 3.2 x 10 is the number 32 written in scientific notation.

Write each number in scientific notation:

1) **6,780,000**

2) **.0678**

3) **678**

4) **67,800**

5) **.678**

6) **.000678**

7) **678,000**

8) **678,000,000**

9) **.00678**

10) **.00000678**

11) **678×10^{14}**

12) **67.8×10^{8}**

13) **$.678 \times 10^{-10}$**

14) **$.0678 \times 10^{9}$**

15) **678×10^{-12}**

16) **6,780**

Place the number to the correct answer for questions 1 through 16 in the box below.

6.78×10^{16}	6.78×10^{2}	6.78×10^{-1}	6.78×10^{-4}	6.78×10^{5}	6.78×10^{6}	6.78×10^{7}	6.78×10^{8}
6.78×10^{9}	6.78×10^{3}	6.78×10^{-2}	6.78×10^{-3}	6.78×10^{4}	6.78×10^{-6}	6.78×10^{-10}	6.78×10^{-11}

Simplify the following:

1) $\frac{1}{2} + \frac{3}{5}$

2) $\frac{4}{5} - 1\frac{3}{5}$

3) $2\frac{1}{3} - 1\frac{2}{5}$

4) $\frac{2}{7} + \frac{4}{9}$

5) $2\frac{2}{5} + 5.256$

6) $\frac{3}{5} + \frac{2}{3} - \frac{3}{10}$

7) $\frac{3}{5} \bullet \frac{2}{9}$

8) $1\frac{1}{5} \bullet \frac{5}{6}$

9) $2\frac{3}{4} \bullet 1\frac{3}{5}$

10) $\frac{3}{4} \div \frac{3}{5}$

11) $\frac{1}{4} \div \frac{3}{4}$

12) $3\frac{1}{7} \div 1\frac{1}{4}$

Place the number to the correct answer for questions 1 through 12 in the box below.

$\frac{46}{63}$	$\frac{14}{15}$	$\frac{-4}{5}$	$\frac{11}{10}$	$\frac{2}{15}$	1	$\frac{957}{125}$	$\frac{88}{35}$	$\frac{5}{4}$	$\frac{29}{30}$	$\frac{1}{3}$	$\frac{22}{5}$

Simplify the following:

1) $-2+3$

2) $7-(-10)$

3) $7-28$

4) $-10+(-34)$

5) (-30) - (-100)

6) $-25-10$

7) $32(-2)$

8) (2)(-3)(-25)

9) 2^3

10) $(-2)^3$

11) -2^4

12) $-(-3)^2$

13) $\frac{100}{-20}$

14) $\frac{-400}{-40}$

15) $200(-2)\div(-5)$

Place the number to the correct answer for questions 1 through 12 in the box below.

20	-9	8	-35	-21	1	70	-5	10	-16	-8	17	150	-44	-64

Solve for x. Show all work.

1) .5x = 3.5

2) $\frac{x}{2}=\frac{-7}{4}$

3) $\frac{2}{3}x+309=711$

4) 3x – 4 = -22

5) 5 – x = 12

6) $\frac{x}{3}+5=7$

7) 5(x – 3) = -20

8) -3(4 – x) = 12

9) $\frac{2}{3}(x-9)=14$

10) 4(x – 3) = 3(x + 7)

11) 5(2x + 3) = 7(x – 3)

12) 2(x – 3) – 4 = 10

13) 5(x – 2) – 3(x + 4) = -20

14) 5x – 13 = 2x + 14

15) 12 – 7x = -3x – 8

Place the number to the correct answer for questions 1 through 15 in the box below.

30	10	-1	8	-3.5	603	33	5	-7	9	6	1	7	-6	-12

Solve the following:

1) $2x + 4 = 8x - 26$

2) $3x - 9 = 2x + 8$

3) $x - 12 = 5x$

4) $7x - 9 = 4x$

5) $3x - 8 = x + 12$

6) $4x + 8 = 2x + 7$

7) $4(x - 3) = -12$

8) $5(2x + 7) = -15$

9) $4(x + 6) = 2(x - 4)$

10) $3(2x - 7) = 6 + 2(x - 3)$

11) $\frac{2x-1}{3} = 5$

12) $\frac{3x+4}{2} = 5$

Place the number to the correct answer for questions 1 through 12 in the box below.

-0.5	10	3	0	-5	-16	5	17	-3	2	8	5.25

Solve the following:

1) $x + 4 \leq -8$

2) $x - 12 > 7$

3) $4x \geq -12$

4) $5 + x < 12$

5) $6 - x > 7$

6) $15 < -3x$

7) $\frac{x}{5} \leq -3$

8) $\frac{x}{-5} > -2$

9) $-\frac{x}{7} > 2$

10) $8 > x - 4$

11) $7 < 4 + x$

12) $-5x \geq -20$

13) $2x - 4 > 12$

14) $-3x + 5 < -7$

15) $\frac{x}{7} - 4 \leq 2$

Place the number to the correct answer for questions 1 through 15 in the box below.

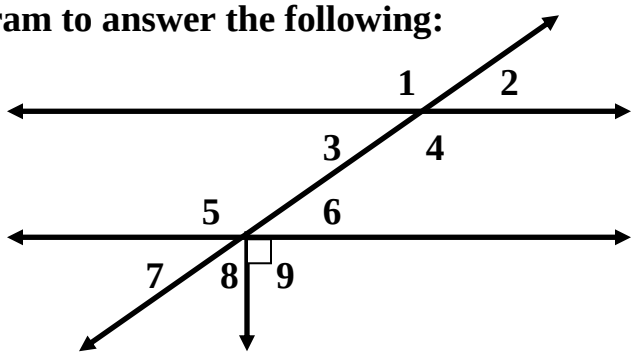
$x \leq 42$	$x > 4$	$x > 8$	$x \leq 4$	$x > 3$	$x < 12$	$x < -14$	$x < 10$	$x \leq -12$	$x < -5$	$x < -1$	$x < 7$	$x \geq -3$	$x > 19$	$x \leq -15$

Match the following definitions:

__1) vertical angles
__2) transversal
__3) complementary angles
__4) supplementary angles
__5) corresponding angles
__6) alternate interior angles

a) sum of two angles is 90 degrees
b) sum of two angles is 180 degrees
c) congruent angles formed by two intersecting lines
d) line that intersects two or more lines
e) angles that lie on the same side of the transversal
f) angles within a pair of lines that lie on opposite sides of a transversal

Use the diagram to answer the following:



7) Which angle is the complement of <7? _____
8) Which angle is the alternate interior angle to <5? _____
9) Which angle is the corresponding angle to <2? _____
10) Which angle is the supplement angle to <1? _____
11) Which angle is the vertical angle to <6? _____
12) Which angle is the alternate interior angle to <6? _____

Place the number to the correct answer for questions 1 through 12 in the box below.

a	b	c	d	E	f
<2	<3	<4	<6	<7	<8

Find the following using the data provided

73 65 60 62 75 75 68 88 90 90 90 100

1) Order the numbers from least to greatest.

2) Identify the following:

a) minimum b) maximum

c) mode d) median

e) range f) mean

3) Place the values in a stem and leaf

6	
7	
8	
9	
10	

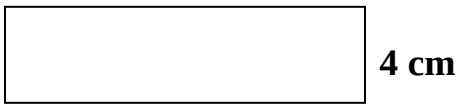
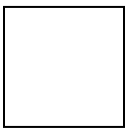
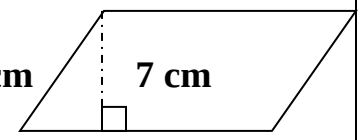
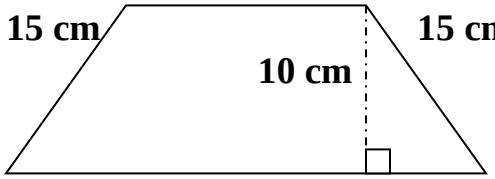
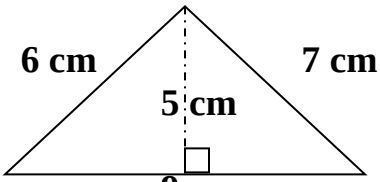
4) Create a box and whisker after identifying the five number summary

Minimum = Q_2 = Median = Q_4 = Maximum =

Identify the answers to 2a through 2f:

60	78	90	100	40	75

Calculate the Perimeter and Area of the following shapes:

	Perimeter	Area
Rectangle 	1)	2)
Square 	3)	4)
Parallelogram 	5)	6)
Trapezoid 	7)	8)
Triangle 	9)	10)

Place the number to the correct answer for questions 1 through 10 in the box below.

Perimeter	22cm	24 cm	32 cm	36 cm	78 cm
Area	**22.5 cm^2**	**36 cm^2**	**48 cm^2**	**70 cm^2**	**240 cm^2**

List the first twenty perfect square numbers greater than zero

List all the prime numbers from 1 to 100 (there should be 25)

Draw a Venn diagram of the number systems. Include Natural, Whole, Integer, Rational, Irrational, and Real Numbers.