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Unit 1 Algebraic Expressions and Integers Review Guide

1. Underline the hundredths place.

a. 95.022 **b. 15,002.811** **c. 0.0076**

2. Write down the place value of the digit 7 in the following numbers.

a. 127,000.223 **b. 33,087.004** **c. 1,630.007**

3. Write the value of the underlined digit.

a. 3,2<u>2</u>9 **b. <u>1</u>00,122,221** **c. 3,009.0<u>9</u>**

4. Write each number in standard form.

a. Ten and two hundredths

b. Eighty-six one-thousandths

c. Three million, fifteen thousand, two hundred twenty-two.

5. Write the following numbers in standard form.

a. 800,000 + 60,000 + 2,000 + 10 + 0.6 + 0.009

b. 1,000 + 90 + 3 + 0.6 + 0.09 + 0.002

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Unit 1 Algebraic Expressions and Integers Review Guide

6. Write the following numbers in expanded form.

a. 18,002.0321

b. 3,000.631

7. Find the terms, constant/s and coefficient/s for each expression.

a. $x + 3y + 12 =$

Terms:
Variables:
Constant:
Coefficients:

b. $c + 7d + 8 =$

Terms
Variables:
Constant:
Coefficients:

c. $100 + z =$

Terms:
Variable:
Constant:
Coefficient:

8. Write an algebraic expression for each verbal phrase.

a. The sum of n and **20**, divided by **9**

b. **3** more than **2** times a number

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Unit 1 Algebraic Expressions and Integers Review Guide

9. Evaluate each expression using the values given.

a. $x + 5y$ $when\ x = 7\ \ and\ y = 9$

b. $a - 2b$ $when\ a = 20\ \ and\ b = 6$

Find the value of each numerical expression. Follow the order of operations when finding each value.

10. $800 - (15 * 2) - (102 - 12) =$

11. $900 \div (90 \div 3 - 10 - 125 \div 25)$

12. $(640 \div 4 - 5) - 361 \div 19 =$

13. $(280 \div 7 + 15) - (216 \div 36 - 6) =$

14. $10^2 - (50 - 7^2) + (343 \div 7) =$

15. $1,000 + (11^2 - 7^2 * 2)^2 =$

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Unit 1 Algebraic Expressions and Integers Review Guide

16. Write an algebraic expression for the word expression.

a. The quotient of x and **30**

b. The sum of **45** and the product of **8** and y

c. Twice a number increased by **89**.

17. Write the word expression for each algebraic expression.

a. $x - 13$

b. $z - 9$

c. $y^3 + 8$

Evaluate each expression for the given values of the variable.

18. $\frac{2x + y}{2} + (4x - y) =$

$x = 20$ $y = 10$

19. $5a + 2b - (a - b)^2 =$

$a = 11$ $b = 5$

20. Write an integer to represent each situation.

a. An increase of **78** points.

b. A profit of **100** dollars.

c. The stock market went down **600** points today.

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Unit 1 Algebraic Expressions and Integers Review Guide

21. Graph each integer or set of integers on a number line.

a. $\{-5, 4\}$

b. $\{-4, -2, 5\}$

22. Find the opposite of each integer.

a. Opposite of -111 **b.** Opposite of -32 **c.** Opposite of $+98$

23. Graph each integer and its opposite on a number line.

a. -6

b. 2

24. Compare the following integers. Write $<, =$ *or* $>$.

a. $2\_\_\_\_ -2$ **b.** $-55\_\_ -62$ **c.** $100\_\_\_\_|-100|$

25. Find the absolute value of the following numbers.

a. $|-17| =$ **b.** $|-212| =$ **c.** $|+35| =$

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Unit 1 Algebraic Expressions and Integers Review Guide

Find the value of each numerical expression. Follow the order of operations when finding each value.

26. $|-105| - 2 * |-10| + 18 \div 3 =$

27. $80 - |-99| \div 3 - |+14| + 20 \div 2 =$

28. Find the sum of each expression below using the rules for adding integers.

a. $-15 + (-12) =$

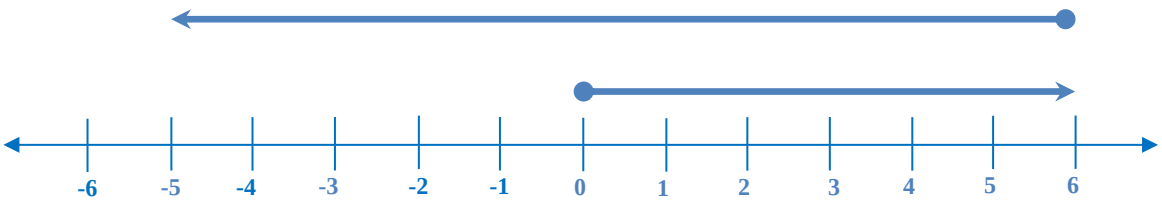
b. $17 + (-42) =$

c. $-110 + 20 =$

29. Show the addition on the number line. Then write the sum.

$5 + (-2) =$

30. Write the expression that each number line demonstrates. Then write the sum.



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Unit 1 Algebraic Expressions and Integers Review Guide

Solve each expression below.

31. $-200 + 45 + [-133 + 33]^2 =$

32. $10 + (-567) + (-11) + (-11) =$

33. At 6 a.m. the temperature was $-6\ ^\circ C$. At noon, the temperature rose $11^\circ C$. What was the temperature at noon?

34. Find the difference of each expression below.

a. $-5 - (-20) =$

b. $7 - (-14) =$

c. $-21 - 20 =$

35. Show the subtraction on the number line. Then write the difference.

$4 - (-2) =$

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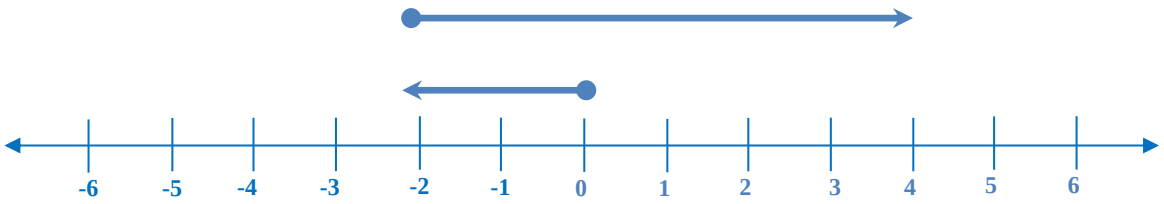
Unit 1 Algebraic Expressions and Integers Review Guide

36. Write the expression that each number line demonstrates. Then write the difference.



Solve each expression below.

37. $-200 + 125 - [60 - 56]^2 =$

38. $100 - (-5) - (-3) + (-8) - 60 =$

39. Round the number to the nearest……..

a. $14,360$
Nearest thousand

b. $2,799$
Nearest hundred

c. 620
Nearest ten

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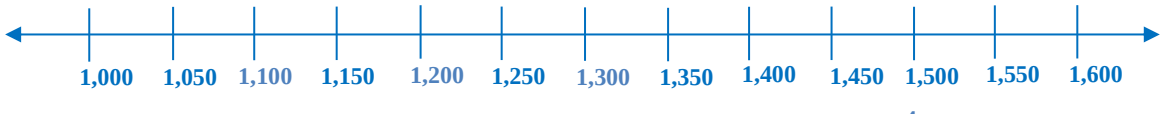
Unit 1 Algebraic Expressions and Integers Review Guide

40. Round the number to the nearest…….. (USE NUMBER LINE)

$\mathbf{1,159}$
Nearest hundred



Estimate the answer using rounding method.

41. $\mathbf{931 + 1,969 =}$

42. $\mathbf{16,899 - 5,960 =}$

Estimate the answer using front end estimation.

43. $\mathbf{4,699 + 677 =}$

44. $\mathbf{999 - 199 =}$

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Unit 1 Algebraic Expressions and Integers Review Guide

Estimate the answer using cluster estimation.

45. $124 + 117 + 99 + 102 =$

46. $11 * 12 * 13 * 14 =$

Write a rule for each number pattern, and find the next number.

47. $2, 6, 18, 54$ … … … ..

Find one counterexample to show that each conjecture is false.

48. **The difference** $a^2 - b^2$ **is equal to** $(a - b)^2$

49. All numbers that are divisible by **3** are also divisible by **6.**

Fill in the missing numbers.

50. **The rule for the pattern shown is** $+5$.
4, _____, $14, 19, 24$, _____, … … … … … ..

51. **The rule for the pattern shown is** -10.
90, _____, $70, 60$, _____, 40, … … … … … ..

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Unit 1 Algebraic Expressions and Integers Review Guide

52. Find the quotient of each expression below using the rules for dividing integers.

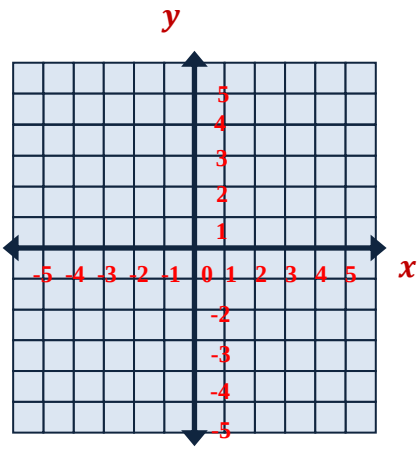
a. $-625 \div (-5) =$ **b.** $210 \div (-3) =$ **c.** $\frac{-600}{10} =$

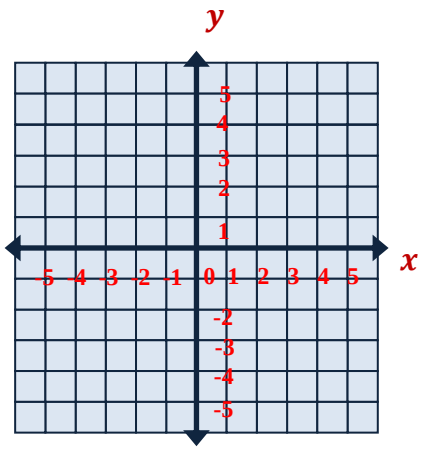
Solve each expression below.

53. $11 * (-10) + [-343 \div 7]^2 =$ **54.** $[40 \div (-5)]^2 - [5 * (-2)]^2 + 24 =$

Graph each point on a coordinate plane and find the line segment lengths.

55. $A\ (-3, 4)\ and\ N\ (-3, -2)$ **56.** $T\ (-4, 2)\ and\ R\ (3, 2)$





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Unit 1 Algebraic Expressions and Integers Review Guide

ANSWERS

1. Underline the hundredths place.

a. 95.022

95.022

b. 15,002.811

15,002.811

c. 0.0076

0.0076

2. Write down the place value of the digit 7 in the following numbers.

a. 127,000.223

One-thousands

b. 33,087.004

Ones

c. 1,630.007

One-thousandths

3. Write the value of the underlined digit.

a. 3,229

Tens
20

b. 100,122,221

Hundred-millions
100,000,000

c. 3,009.09

Hundredths
0.09

4. Write each number in standard form.

a. Ten and two hundredths

10.02

b. Eighty-six one-thousandths

0.086

c. Three million, fifteen thousand, two hundred twenty-two.

3, 015,222

5. Write the following numbers in standard form.

a. 800,000 + 60,000 + 2,000 + 10 + 0.6 + 0.009

862,010.609

b. 1,000 + 90 + 3 + 0.6 + 0.09 + 0.002

1,093.692

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Unit 1 Algebraic Expressions and Integers Review Guide

6. Write the following numbers in expanded form.

a. 18,002.0321

Value of 1 = 1 * 10,000 = 10,000
Value of 8 = 8 * 1,000 = 8,000
Value of 2 = 2 * 1 = 2
Value of 3 = 3 * 0.01 = 0.03
Value of 2 = 2 * 0.001 = 0.002
Value of 1 = 1 * 0.0001 = 0.0001

18,002.0321= 10,000+ 8,000+ 2 + 0.03+ 0.002+ 0.0001

b. 3,000.631

Value of 3 = 3 * 1,000 = 3,000
Value of 6 = 6 * 0.1 = 0.6
Value of 3 = 3 * 0.01 = 0.03
Value of 1 = 1 * 0.001 = 0.001

3,000.631= 3,000 + 0.6 + 0.03 + 0.001

7. Find the terms, constant/s and coefficient/s for each expression.

a. $x + 3y + 12 =$

Terms: $x, 3y, 12$
Variables: x, y
Constant: 12
Coefficients: $1, 3$

b. $c + 7d + 8 =$

Terms: $c, 7d, 8$
Variables: c, d
Constant: 8
Coefficients: $1, 7$

c. $100 + z =$

Terms: $100, z$
Variable: z
Constant: 100
Coefficient: 1

8. Write an algebraic expression for each verbal phrase.

a. The sum of n and **20**, divided by **9**

$(n + 20) \div 9$

b. **3** more than **2** times a number

$3 + 2k$

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Unit 1 Algebraic Expressions and Integers Review Guide

9. Evaluate each expression using the values given.

a. $x + 5y$ $\quad when\ x = 7\ \ and\ \ y = 9$

$$x + 5y =$$
$$7 + 5 * 9 =$$
$$= 7 + 45 =$$
$$= 52$$

b. $a - 2b$ $\quad when\ a = 20\ \ and\ \ b = 6$

$$a - 2b =$$
$$= 20 - 2 * 6 =$$
$$= 20 - 12 =$$
$$= 8$$

Find the value of each numerical expression. Follow the order of operations when finding each value.

10. $800 - (15 * 2) - (102 - 12) =$

$$800 - (15 * 2) - (102 - 12) =$$
$$= 800 - 30 - 90 =$$
$$= 770 - 90 =$$
$$= 680$$

11. $900 \div (90 \div 3 - 10 - 125 \div 25)$

$$900 \div (90 \div 3 - 10 - 125 \div 25)$$
$$= 900 \div (30 - 10 - 5) =$$
$$= 900 \div (20 - 5) =$$
$$= 900 \div 15 =$$
$$= 60$$

12. $(640 \div 4 - 5) - 361 \div 19 =$

$$(640 \div 4 - 5) - 361 \div 19 =$$
$$= (160 - 5) - 361 \div 19 =$$
$$= 155 - 361 \div 19 =$$
$$= 155 - 19 =$$
$$= 136$$

13. $(280 \div 7 + 15) - (216 \div 36 - 6) =$

$$(280 \div 7 + 15) - (216 \div 36 - 6) =$$
$$= (40 + 15) - (6 - 6) =$$
$$= 55 - 0 =$$
$$= 55$$

14. $10^2 - (50 - 7^2) + (343 \div 7) =$

$$10^2 - (50 - 7^2) + (343 \div 7) =$$
$$= 100 - (50 - 49) + 49 =$$
$$= 100 - 1 + 49 =$$
$$= 99 + 49 =$$
$$= 148$$

15. $1,000 + (11^2 - 7^2 * 2)^2 =$

$$1,000 + (11^2 - 7^2 * 2)^2 =$$
$$= 1,000 + (121 - 49 * 2)^2 =$$
$$= 1,000 + (121 - 98)^2 =$$
$$= 1,000 + (23)^2 =$$
$$= 1,000 + 529 =$$
$$= 1,529$$

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Unit 1 Algebraic Expressions and Integers Review Guide

16. Write an algebraic expression for the word expression.

a. The quotient of x and 30

$\frac{x}{30}$ *or* $x \div 30$

b. The sum of **45** and the product of **8** and y

$45 + 8y$

c. Twice a number increased by **89**.

$2n + 89$

17. Write the word expression for each algebraic expression.

a. $x - 13$

The difference of a number x and 13

b. $z - 9$

A number z take away 9

c. $y^3 + 8$

y cubed increased by 8

Evaluate each expression for the given values of the variable.

18. $\frac{2x + y}{2} + (4x - y) =$

$x = 20 \qquad y = 10$

$$\frac{2x + y}{2} + (4x - y) =$$
$$= \frac{2 * 20 + 10}{2} + (4 * 20 - 10) =$$
$$= \frac{40 + 10}{2} + (80 - 10) =$$
$$= \frac{50}{2} + 70 =$$
$$= 25 + 70 =$$
$$= 95$$

19. $5a + 2b - (a - b)^2 =$

$a = 11 \qquad b = 5$

$$5a + 2b - (a - b)^2 =$$
$$= 5 * 11 + 2 * 5 - (11 - 5)^2 =$$
$$= 55 + 10 - (6)^2 =$$
$$= 55 + 10 - 36 =$$
$$= 65 - 36 =$$
$$= 29$$

20. Write an integer to represent each situation.

a. An increase of **78** points.

$+78$

b. A profit of **100** dollars.

$+100$

c. The stock market went down **600** points today.

-600

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Unit 1 Algebraic Expressions and Integers Review Guide

21. Graph each integer or set of integers on a number line.

a. $\{-5, 4\}$ $\{-5, 4\}$

b. $\{-4, -2, 5\}$ $\{-4, -2, 5\}$

22. Find the opposite of each integer.

a. Opposite of -111 $+111$

b. Opposite of -32 $+32$

c. Opposite of $+98$ -98

23. Graph each integer and its opposite on a number line.

a. -6 $+6$

b. 2 -1

24. Compare the following integers. Write $<, =$ *or* $>$.

a. $2\_\_\_\_ -2$ $2 > -2$

b. $-55\_\_ -62$ $-55 > -62$

c. $100\_\_\_\_|-100|$ $100 = |-100|$

25. Find the absolute value of the following numbers.

a. $|-17| =$ $|-17| = 17$

b. $|-212| =$ $|-212| = 212$

c. $|+35| =$ $|+35| = 35$

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Unit 1 Algebraic Expressions and Integers Review Guide

Find the value of each numerical expression. Follow the order of operations when finding each value.

26. $|-105| - 2 * |-10| + 18 \div 3 =$

$|-105| - 2 * |-10| + 18 \div 3 =$
$= 105 - 2 * 10 + 18 \div 3 =$
$= 105 - 20 + 6 =$
$= 85 + 6 =$
$= 91$

27. $80 - |-99| \div 3 - |+14| + 20 \div 2 =$

$80 - |-99| \div 3 - |+14| + 20 \div 2 =$
$= 80 - 99 \div 3 - 14 + 20 \div 2 =$
$= 80 - 33 - 14 + 10 =$
$= 47 - 14 + 10 =$
$= 33 + 10 =$
$= 43$

28. Find the sum of each expression below using the rules for adding integers.

a. $-15 + (-12) =$

$-15 + (-12) = -27$

b. $17 + (-42) =$

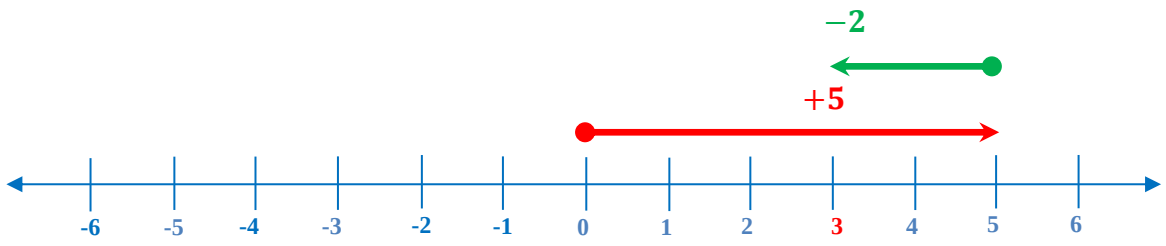
$17 + (-42) = -25$

c. $-110 + 20 =$

$-110 + 20 = -90$

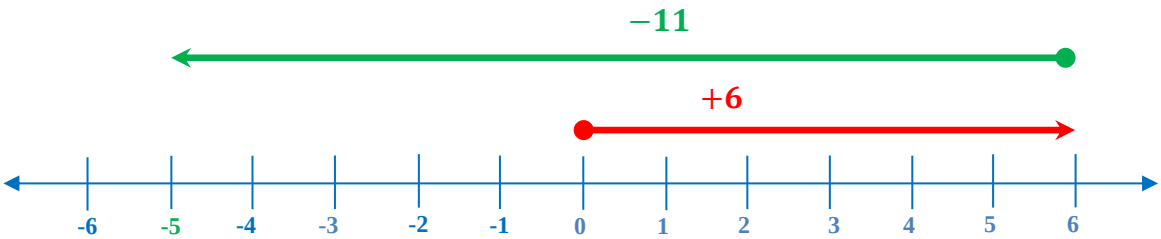
29. Show the addition on the number line. Then write the sum.

$5 + (-2) =$



$5 + (-2) = 3$

30. Write the expression that each number line demonstrates. Then write the sum.



$6 + (-11) = -5$

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Unit 1 Algebraic Expressions and Integers Review Guide

Solve each expression below.

31. $-200 + 45 + [-133 + 33]^2 =$

$-200 + 45 + [-133 + 33]^2 =$
$= -200 + 45 + [-100]^2 =$
$= -200 + 45 + 10,000 =$
$= -155 + 10,000 =$
$= \mathbf{9,845}$

32. $10 + (-567) + (-11) + (-11) =$

$10 + (-567) + (-11) + (-11) =$
$= -557 + (-11) + (-11) =$
$= -546 + (-11) =$
$= \mathbf{-557}$

33. At 6 a.m. the temperature was $-6\ °C$. At noon, the temperature rose $11°C$. What was the temperature at noon?

Temperature in 6 a.m. $-6\ °C = -6$
…. rose $11°C = +11$

$-6 + 11 = \mathbf{5}$
The temperature at noon was $\mathbf{5°C}$.

34. Find the difference of each expression below.

a. $-5 - (-20) =$

$-5 - (-20) =$
$= -5 + 20 =$
$= 15$

b. $7 - (-14) =$

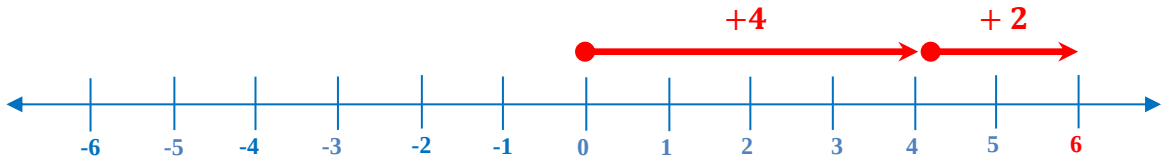
$7 - (-14) =$
$= 7 + 14 =$
$= 21$

c. $-21 - 20 =$

$-21 - 20 =$
$= -21 + (-20) =$
$= -41$

35. Show the subtraction on the number line. Then write the difference.

$4 - (-2) =$



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

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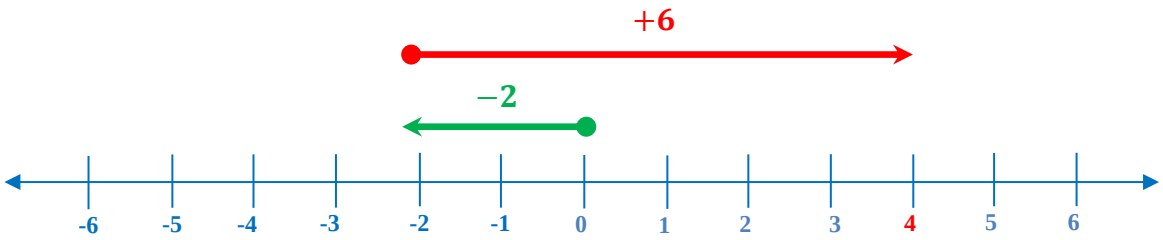
Unit 1 Algebraic Expressions and Integers Review Guide

36. Write the expression that each number line demonstrates. Then write the difference.



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

Solve each expression below.

37. $-200+125-[60-56]^2=$

$$-200+125-[60-56]^2=$$
$$=-200+125-[60+(-56)]^2=$$
$$=-200+125-[-4]^2$$
$$=-200+125-16$$
$$=-75-16=$$
$$=-75+(-16)=$$
$$=-91$$

38. $100-(-5)-(-3)+(-8)-60=$

$$100-(-5)-(-3)+(-8)-60=$$
$$=100+5-(-3)+(-8)-60=$$
$$=105-(-3)+(-8)-60=$$
$$=105+3+(-8)-60=$$
$$=108+(-8)-60=$$
$$=100-60=$$
$$=100+(-60)=$$
$$=40$$

39. Round the number to the nearest……..

a. $14,360$
Nearest thousand

$14,\boxed{3}60 \rightarrow 14,000$

b. $2,799$
Nearest hundred

$2,7\boxed{9}9 \rightarrow 2,800$

c. 620
Nearest ten

$62\boxed{0} \rightarrow 620$

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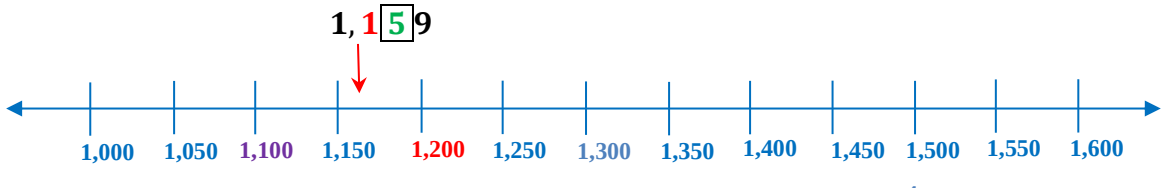
Unit 1 Algebraic Expressions and Integers Review Guide

40. Round the number to the nearest…….. (USE NUMBER LINE)

$1,159$

Nearest hundred



$1,159 \rightarrow 1,200$

Estimate the answer using rounding method.

41. $931 + 1,969 =$

$931 + 1,969 =$

Round to nearest ten

$931 \rightarrow 930$

$1,969 \rightarrow 1,970$

$930 + 1,970 = 2,900$

42. $16,899 - 5,960 =$

$16,899 - 5,960 =$

Round to nearest thousand

$16,899 \rightarrow 17,000$

$5,960 \rightarrow 6,000$

$17,000 - 6,000 = 11,000$

Estimate the answer using front end estimation.

43. $4,699 + 677 =$

$4,699 + 677 =$

$4,699 \rightarrow 5,000$

$677 \rightarrow 700$

$5,000 + 700 = 5,700$

44. $999 - 199 =$

$999 - 199 =$

$999 \rightarrow 1,000$

$199 \rightarrow 200$

$1,000 - 200 = 800$

Name: _____ Period: _____ Date: _____

Unit 1 Algebraic Expressions and Integers Review Guide

Estimate the answer using cluster estimation.

45. $124 + 117 + 99 + 102 =$

$124 + 117 + 99 + 102 =$

Notice that they all cluster around **100**.

$100 + 100 + 100 + 100 =$

$4 * 100 = 400$

Real answer:

$124 + 117 + 99 + 102 = 442$

46. $11 * 12 * 13 * 14 =$

$11 * 12 * 13 * 14 =$

Notice that they all cluster around **10**.

$10 * 10 * 10 * 10 = 10,000$

Real answer:

$11 * 12 * 13 * 14 = 24,024$

Write a rule for each number pattern, and find the next number.

47. $2, 6, 18, 54$ … … … ..

Start with 3 , each number is 3 times the previous number.

$2 * 3 = 6$

$6 * 3 = 18$

$18 * 3 = 54$

$54 * 3 = 162$

The next number is **162**

Find one counterexample to show that each conjecture is false.

48. **The difference $a^2 - b^2$ is equal to $(a - b)^2$**

$a^2 - b^2 = (a - b)^2$

$6^2 - 5^2 = 36 - 25 = 11$

$(6 - 5)^2 = 1^2 = 1$

$11 \neq 1$

49. All numbers that are divisible by 3 are also divisible by 6.

9 is divisible by 3 but no divisible by 6.

Fill in the missing numbers.

50. **The rule for the pattern shown is $+5$.**

$4, \_\_\_\_\_, 14, 19, 24, \_\_\_\_\_,$ … … … … … ..

$4 + 5 = 9$

$9 + 5 = 14$

$14 + 5 = 19$

$19 + 5 = 24$

$24 + 5 = 29$

$4, 9, 14, 19, 24, 29,$ … … … … ….

51. **The rule for the pattern shown is -10.**

$90, \_\_\_\_\_, 70, 60, \_\_\_\_\_, 40,$ … … … … … ..

$90 - 10 = 80$

$80 - 10 = 70$

$70 - 10 = 60$

$60 - 10 = 50$

$50 - 10 = 40$

$90, 80, 70, 60, 50, 40$ … … … … … ..

Name: _____ Period: _____ Date: _____

Unit 1 Algebraic Expressions and Integers Review Guide

52. Find the quotient of each expression below using the rules for dividing integers.

a. $-625 \div (-5) =$ **b.** $210 \div (-3) =$ **c.** $\frac{-600}{10} =$

$-625 \div (-5) = 125$ $210 \div (-3) = -70$ $\frac{-600}{10} = -6$

Solve each expression below.

53. $11 * (-10) + [-343 \div 7]^2 =$

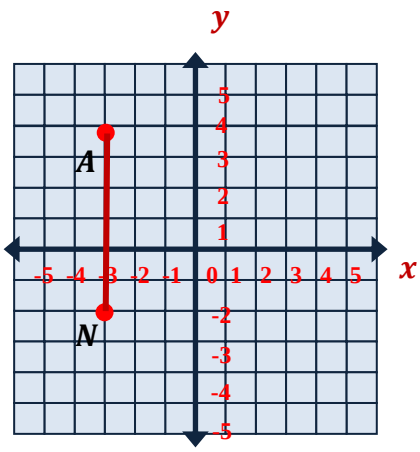
$11 * (-10) + [-343 \div 7]^2 =$
$= 11 * (-10) + [-49]^2 =$
$= 11 * (-10) + 2,401 =$
$= -110 + 2,401 =$
$= 2,291$

54. $[40 \div (-5)]^2 - [5 * (-2)]^2 + 24 =$

$[40 \div (-5)]^2 - [5 * (-2)]^2 + 24 =$
$= [-8]^2 - [-10]^2 + 24 =$
$= 64 - 100 + 24 =$
$= 64 + (-100) + 24 =$
$= -136 + 24 =$
$= -112$

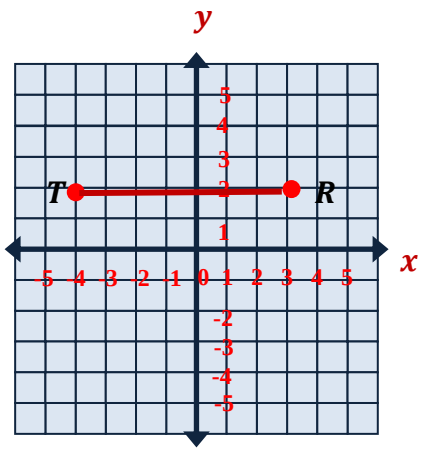
Graph each point on a coordinate plane and find the line segment lengths.

55. $A\ (-3, 4)\ and\ N\ (-3, -2)$



$\overline{AN}$ **is vertical**
$\overline{AN} = |difference\ of\ y - coordinates|$
$\overline{AN} = |4 - (-2)| = |4 + 2| = 6$
$\overline{AN} = 6\ units$

56. $T\ (-4, 2)\ and\ R\ (3, 2)$



$\overline{TR}$ **is horizontal**
$\overline{TR} = |difference\ of\ x - coordinates|$
$\overline{TR} = |3 - (-4)| = |3 + 4| = 7$
$\overline{TR} = 7\ units$