Contents

CHAPTER R REVIEW OF PREALGEBRA

Section R.1 Operations with Integers

1. The number 0 belongs to the set of whole numbers and all whole numbers also belong to the set of integers.

2. The number 6 belongs to the set of natural numbers. All natural numbers also belong to the set of whole numbers and to the set of integers.

3. The number –20 belongs to the set of integers.

4. The number –7 belongs to the set of integers.

5. The number 11 belongs to the set of natural numbers. All natural numbers also belong to the set of whole numbers and to the set of integers.

6. The number 0 belongs to the set of whole numbers and all whole numbers also belong to the set of integers.

7. The number –9 belongs to the set of integers.

8. The number –3 belongs to the set of integers.

9. The number 1 belongs to the set of natural numbers. All natural numbers also belong to the set of whole numbers and to the set of integers.

10. The number –1 belongs to the set of integers.

11. The value for the population of Los Angeles is a natural number. The population could be 10,000, 100,000, 1,000,000 .... Assuming the population would not be 0, the value 0 is not included as a possibility. These values are also whole numbers and integers.

12. The value for the number of people in a crowd at the beach is a natural number. The number could be 5, 10, 25 .... Assuming the number would not be 0, because there would not be a crowd if there were 0 people. These values are also whole numbers and integers.

13. The value for the population of Norfolk, VA is a natural number. The population could be 10,000, 100,000, 1,000,000 .... Assuming the population would not be 0, the value 0 is not included as a possibility. These values are also whole numbers and integers.

14. The value for the number of children attending Sullivan Middle School graduation is a natural number. The number could be 25, 60, 110 .... Assuming the number would not be 0 because the graduates are children, the value 0 is not included as a possibility. These values are also whole numbers and integers.

15. The value for the number of kittens in the animal shelter is a whole number. The number of kittens could be 0, 1, 2, ... Since the animal shelter could be empty of kittens on any given day (0 kittens), the value 0 is included as a possibility. These values are also integers.

16. The value for the number of puppies in the animal shelter is a whole number. The number of puppies could be 0, 1, 2, ... Since the animal shelter could be empty of puppies on any given day (0 puppies), the value 0 is included as a possibility. These values are also integers.

17. The value for the number of hours worked weekly by a Home Depot employee is a whole number. The number of hours worked could be 0, 5, 12, ... Since the employee could have a week off (0 hours worked), the value 0 is included as a possibility. These values are also integers.

18. The value for the number of hours worked yearly by an auto worker is a whole number. The number of hours worked could be 0, 100, 220, ... Since the employee could be laid off or otherwise have no work (0 hours worked), the value 0 is included as a possibility. These values are also integers.

19. This is an example from the set of integers. The average daily high temperature in Missoula could range from negative numbers to positive numbers.

20. This is an example from the set of natural numbers. The average daily high temperature in Honolulu has never been recorded below 12°F so this belongs to the set of natural numbers. These values are also whole numbers and integers.

21. The set of all integers between –5 and 1, *including* –5 and 1 is as follows: {–5, –4, –3, –2, –1, 0, 1}

22. The set of all integers between –2 and 4, *including* –2 and 4 is as follows: {–2, –1, 0, 1, 2, 3, 4}

23. The set of all natural numbers between –5 and 5, **not** including –5 and 5 is as follows: {1, 2, 3, 4}. Notice that negative values and 0 are not included because this is a set of only natural numbers.

24. The set of all natural numbers between –6 and 4, **not** including –6 and 4 is as follows: {1, 2, 3}. Notice that negative values and 0 are not included because this is a set of only natural numbers.

25. The set of all whole numbers between –4 and 0, including –4 and 0 is as follows: {0}. Notice that negative values are not included because this is a set of only whole numbers.

26. The set of all whole numbers between –3 and 3, including –3 and 3 is as follows: {0, 1, 2, 3}. Notice that negative values are not included because this is a set of only whole numbers.

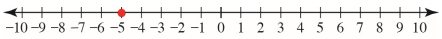
27. The tick marks on the number line are 4 units apart, so the scale of this number line is 4.

28. The tick marks on the number line are 7 units apart, so the scale of this number line is 7.

29. The tick marks on the number line are 0.1 units apart, so the scale of this number line is 0.1.

30. The tick marks on the number line are 0.25 unit apart, so the scale of this number line is 0.25.

31.



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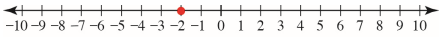

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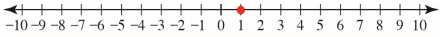

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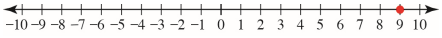

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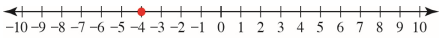

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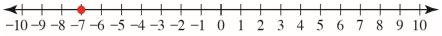


37. The number –5 is to the right of –15 on the number line, therefore –5 is greater than –15.

$-5 > -15$

38. The number –6 is to the left of 0 on the number line, therefore –6 is less than 0.

$-6 < 0$

39. The number –3 is at the same location as –3 on the number line, and is therefore neither less than nor greater than –3. Write an expression using inequality symbols as follows:

$-3 \le -3$ or $-3 \ge -3$

40. The number 8 is at the same location as 8 on the number line, and is therefore neither less than nor greater than 8. Write an expression using inequality symbols as follows:

$8 \le 8$ or $8 \ge 8$

41. The number –4 is to the left of –3 on the number line, therefore –4 is less than –3.

$-4 < -3$

42. The number –9 is to the left of –8 on the number line, therefore –9 is less than –8.

$-9 < -8$

43. The number 0 is to the right of –7 on the number line, therefore 0 is greater than –7.

$0 > -7$

44. The number 0 is to the right of –1 on the number line, therefore 0 is greater than –1.

$0 > -1$

45. $|-3| = 3$ since the distance between –3 and 0 is 3 units.

46. $|-11| = 11$ since the distance between –11 and 0 is 11 units.

47. $|8| = 8$ since the distance between 8 and 0 is 8 units.

48. $|0| = 0$ since there is no distance between 0 and itself on the number line.

49. $|16| = 16$ since the distance between 16 and 0 is 16 units.

50. $|9| = 9$ since the distance between 9 and 0 is 9 units.

51. $|-7| = 7$ since the distance between –7 and 0 is 7 units.

52. $|-15| = 15$ since the distance between –15 and 0 is 15 units.

53. Order the numbers from smallest to largest (from left to right as they would appear on the number line) as follows:

$$-\frac{3}{2},\ -1,\ \frac{1}{3},\ 0.5,\ 2.95,\ 3$$

54. Order the numbers from smallest to largest (from left to right as they would appear on the number line) as follows:

$$-4.5,\ -2,\ -1.75,\ -\frac{1}{4},\ 3.5,\ 5$$

55. First, find any absolute values.

$|-5| = 5$

$-5 = -5$

$|-2| = 2$

$-2 = -2$

Then order the numbers from smallest to largest (from left to right as they would appear on the number line) writing each term in its original notation as follows:

$$-5,\ -2,\ |-2|,\ |-5|$$

56. First, find any absolute values.

$|8| = 8$

$-8 = -8$

$|-0| = 0$

$0 = 0$

Then order the numbers from smallest to largest (from left to right as they would appear on the number line) writing each term in its original notation as follows:

$$-8,\ |-0|,\ 0,\ |8| \text{ or } -8,\ 0,\ |-0|,\ |8|$$

57. First, find any absolute values.

$|-4| = 4$

$-3.5 = -3.5$

$|-5| = 5$

$\frac{2}{3} = \frac{2}{3}$

$4.2 = 4.2$

Then order the numbers from smallest to largest (from left to right as they would appear on the number line) writing each term in its original notation as follows:

$$-3.5,\ \frac{2}{3},\ |-4|,\ 4.2,\ |-5|$$

58. First, find any absolute values.

$-7 = -7$

$|-7| = 7$

$\frac{5}{4} = \frac{5}{4} = 1\frac{1}{4}$

$|-1| = 1$

$\frac{9}{3} = \frac{9}{3} = 3$

$|-3| = 3$

Then order the numbers from smallest to largest (from left to right as they would appear on the number line) writing each term in its original notation as follows:

$$-7,\ |-1|,\ \frac{5}{4},\ \frac{9}{3},\ |-3|,\ |-7| \text{ or}$$

$$-7,\ |-1|,\ \frac{5}{4},\ |-3|,\ \frac{9}{3},\ |-7|$$

59. The expression translates as, "the opposite of five."

$-(5) = -5$

60. The expression translates as, "the opposite of negative 5."

$$-(-5) = 5$$

61. The expression translates as, "the opposite of the absolute value of negative 2."

$$-|-2| = -2$$

62. The expression translates as, "the opposite of the absolute value of negative 4."

$$-|-4| = -4$$

63. The expression translates as, "the opposite of negative six."

$$-(-6) = 6$$

64. The expression translates as, "the opposite of the opposite of negative five."

$$-(-(-5)) = -5$$

65. The two integers have the same sign, so we add the two numbers using the rule for adding integers and keep the negative sign.

$$-3 + (-5) = -8$$

66. The two integers have the same sign, so we add the two numbers using the rule for adding integers and keep the negative sign.

$$-4 + (-9) = -13$$

67. The two integers have different signs. Adding a negative number is the same as subtracting the number, so we will subtract 7 from 16.

$$16 + (-7) = 16 - 7 = 9$$

68. These two integers have different signs. Take the absolute value of each number and subtract the smaller absolute value from the larger. Subtract 8 from 15.

$$15 - 8 = 7$$

Attach the sign of the number that is larger in absolute value. Since the number that is larger is +15, the answer is +7 or simply 7.

69. These two integers have different signs. Take the absolute value of each number and subtract the smaller absolute value from the larger. Subtract 6 from 13.

$$13 - 6 = 7$$

Attach the sign of the number that is larger in absolute value. The number that is larger in absolute value is –13, so the answer will be negative. Attach a negative sign to 7.

$$-13 + 6 = -7$$

The final answer is –7.

70. These two integers have different signs. Take the absolute value of each number and subtract the smaller absolute value from the larger. Subtract 12 from 20.

$$20 - 12 = 8$$

Attach the sign of the number that is larger in absolute value. The number that is larger in absolute value is –20, so the answer will be negative. Attach a negative sign to 8.

$$-20 + 12 = -8$$

The final answer is –8.

71. The two integers are being subtracted. Change the sign of the second number and add. Add the two numbers using the rule for adding integers, keeping the negative sign because both numbers are negative.

$$-7 + (-9) = -16$$

72. The two integers are being subtracted. Change the sign of the second number and add. Add the two numbers using the rule for adding integers, keeping the negative sign because both numbers are negative.

$$-6 + (-13) = -19$$

73. Using the rule for subtracting integers, change the sign of the second term and add the terms.

$$-4 - (-8) = -4 + 8$$

Subtracting a negative is the same as adding so we now have two integers with different signs. Take the absolute value of each number and subtract the smaller absolute value from the larger. Subtract 4 from 8.

$$8 - 4 = 4$$

Attach the sign of the number that is larger in absolute value. Since the number that is larger is positive, the answer is positive.

$$-4 - (-8) = 4$$

74. Using the rule for subtracting integers, change the sign of the second term and add the terms.

$$-7-(-1)=-7+1$$

Subtracting a negative is the same as adding so we now have two integers with different signs. Take the absolute value of each number and subtract the smaller absolute value from the larger. Subtract 1 from 7.

$$7-1=6$$

Attach the sign of the number that is larger in absolute value. The number that is larger in absolute value is –7, so the answer will be negative. Attach a negative sign to 6.

$$-7+1=-6$$

The final answer is –6.

75. Using the rule for subtracting integers, change the sign of the second term and add the terms.

$$-12-(-11)=-12+11$$

Subtracting a negative is the same as adding so we now have two integers with different signs. Take the absolute value of each number and subtract the smaller absolute value from the larger. Subtract 11 from 12.

$$12-11=1$$

Attach the sign of the number that is larger in absolute value. The number that is larger in absolute value is –12, so the answer will be negative. Attach a negative sign to 1.

$$-12+11=-1$$

The final answer is –1.

76. Using the rule for subtracting integers, change the sign of the second term and add the terms.

$$-17-(-18)=-17+18$$

Subtracting a negative is the same as adding so we now have two integers with different signs. Take the absolute value of each number and subtract the smaller absolute value from the larger. Subtract 17 from 18.

$$18-17=1$$

Attach the sign of the number that is larger in absolute value. Since the number that is larger is positive, the answer is positive.

$$-17+18=1$$

77. The temperature can be found by subtracting $-23-3$. To subtract two integers, change the sign of the second integer and add. Therefore, we compute

$$-23+(-3)=-26$$

The final temperature is -26°F.

78. The temperature can be found by adding $-6+20$. These integers have different signs. The number with the larger absolute value is 20, therefore subtract 6 from 20.

$$20-6=14$$

The number with the larger absolute value is positive 20, therefore the result is positive and the final temperature is 14°F.

79. Beginning with the depth of 30 feet below the surface, or –30 feet, and going another 20 feet deeper, or –20 feet. This can be represented by the expression

$$-30-20$$

To subtract two integers, change the sign of the second integer and add. Therefore, we compute

$$-30+(-20)=-50$$

Ray and Karin are at a depth of –50 feet.

80. The starting elevation is 282 feet below sea level, or –282 feet, and the ending elevation is 8360 feet above sea level, which is positive 8360 feet. We need to find the difference between the two elevations which translates to subtraction and we are looking for the total change in elevation, a positive value, so we will use the absolute value and compute.

$$\begin{aligned}&|-282-8360|\\&=|-282+(-8360)|\\&=|-8642|\\&=8642\end{aligned}$$

Therefore, the total change in elevation that the runners experience is 8642 feet

81. To find the distance between these two points we will use the formula $|b-a|$. Let $a=7$ and $b=-2$ and substitute into the formula.

$$\begin{aligned}|b-a| &= |-2-7| \\ &= |-9| \\ &= 9\end{aligned}$$

82. To find the distance between these two points we will use the formula $|b-a|$. Let $a=5$ and $b=-6$ and substitute into the formula.

$$\begin{aligned}|b-a| &= |-6-5| \\ &= |-11| \\ &= 11\end{aligned}$$

83. To find the distance between these two points we will use the formula $|b-a|$. Let $a=-1$ and $b=-9$ and substitute into the formula.

$$\begin{aligned}|b-a| &= |-9-(-1)| \\ &= |-9+1| \\ &= |-8| \\ &= 8\end{aligned}$$

84. To find the distance between these two points we will use the formula $|b-a|$. Let $a=-8$ and $b=-22$ and substitute into the formula.

$$\begin{aligned}|b-a| &= |-22-(-8)| \\ &= |-22+8| \\ &= |-14| \\ &= 14\end{aligned}$$

85. To find the distance between these two points we will use the formula $|b-a|$. Let $a=-16$ and $b=-35$ and substitute into the formula.

$$\begin{aligned}|b-a| &= |-35-(-16)| \\ &= |-36+16| \\ &= |-19| \\ &= 19\end{aligned}$$

86. To find the distance between these two points we will use the formula $|b-a|$. Let $a=-26$ and $b=-5$ and substitute into the formula.

$$\begin{aligned}|b-a| &= |-5-(-26)| \\ &= |-5+26| \\ &= |21| \\ &= 21\end{aligned}$$

87. $3(-2) = -6$

The answer is negative since the two integers have different signs.

88. $5(-6) = -30$

The answer is negative since the two integers have different signs.

89. $(-4)(5) = -20$

The answer is negative since the two integers have different signs.

90. $(-3)(15) = -45$

The answer is negative since the two integers have different signs.

91. $(-3)(-6) = 18$

The answer is positive since the two integers have the same sign.

92. $(-5)(-9) = 45$

The answer is positive since the two integers have the same sign.

93. $(-24) \div (-8) = 3$

The answer is positive since the two integers have the same sign.

94. $(-12) \div (-3) = 4$

The answer is positive since the two integers have the same sign.

95. $(30) \div (-5) = -6$

The answer is negative since the two integers have different signs.

96. $(27) \div (-9) = -3$

The answer is negative since the two integers have different signs.

97. $9 \div 0 = \text{undefined}$

By definition, any number divided by zero is undefined.

98. $-5 \div 0 = \text{undefined}$

By definition, any number divided by zero is undefined.

99. $0 \div 8 = 0$

Zero divided by any number is always 0.

100. $0 \div (-2) = 0$

Zero divided by any number is always 0.

Exercises 101-108: The terms in the expressions are outlined.

101. $\boxed{-3} + \boxed{5 \cdot 6}$

This expression has 2 terms. Terms are separated by addition and subtraction symbols.

102. $\boxed{16 \cdot 3} + \boxed{9}$

This expression has 2 terms.

103. $\boxed{-24 \div 3 \cdot 7}$

This expression has 1 term.

104. $\boxed{100 \cdot (-2) \div 5}$

This expression has 1 term.

105. $\boxed{3} + \boxed{22 \div 11}\boxed{-16 \div 4}$

This expression has 3 terms.

106. $\boxed{42 \div 5}\boxed{-(-6)7} + \boxed{12}$

This expression has 3 terms.

107. $\boxed{92 \cdot (-8)} + \boxed{26 \div 13}\boxed{-1} + \boxed{7(-3)}$

This expression has 4 terms.

108. $\boxed{(-5) \cdot (-6)}\boxed{-4 \div (-2)} + \boxed{10}\boxed{-4(-2)}$

This expression has 4 terms.

109. This expression has 1 term.

$\boxed{16 \div (-8) \cdot 3}$ Outline the term.
$= -2 \cdot 3$ Work left to right.
$= -6$

110. This expression has 1 term.

$\boxed{(-25) \div 5 \cdot (-4)}$ Outline the term.
$= -5 \cdot (-4)$ Work left to right.
$= 20$

111. This expression has 2 terms.

$\boxed{-9} + \boxed{3 \cdot 5}$ Outline the terms.
$= -9 + 15$ Do operation inside each term.
$= 6$

112. This expression has 2 terms.

$\boxed{6 \cdot (-2)} + \boxed{18}$ Outline the terms.
$= -12 + 18$ Do operation inside each term.
$= 6$

113. This expression has 3 terms.

$\boxed{9} + \boxed{24 \div 3}\boxed{-3 \cdot (-2)}$ Outline the terms.
$= 9 + 8 + 6$ Do operation inside each term.
$= 23$ Add from left to right.

114. This expression has 3 terms.

$\boxed{56 \div (-8)} + \boxed{3 \cdot 5}\boxed{-(-7)}$ Outline the terms.
$= -7 + 15 + 7$ Do operation inside each term.
$= 15$ Add/subtract from left to right.

115. This expression has 3 terms.

$\boxed{-14 \div 2} + \boxed{5 \cdot 4 \div 10}\boxed{-(-1)}$ Outline the terms.
$= -7 + \boxed{20 \div 10} + 1$ Do operation inside each term.
$= -7 + 2 + 1$ Add/subtract from left to right.
$= -4$

116. This expression has 3 terms.

$\boxed{9 \cdot 4 \div (-6)}\boxed{-(-16)} + \boxed{8 \cdot 2}$ Outline the terms.
$= \boxed{36 \div (-6)} + 16 + 16$ Do operation inside each term.
$= -6 + 16 + 16$ Add/subtract from left to right.
$= 26$

117. This expression has 4 terms.

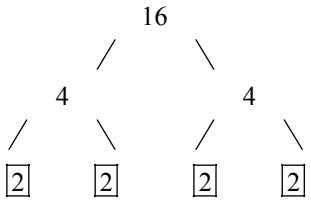
$\boxed{100 \div 50 \cdot 3}\boxed{-2 \cdot (-7)} + \boxed{4 \cdot 2}\boxed{-(-2)}$
Outline terms.
$= \boxed{2 \cdot 3} + 14 + 8 + 2$ Do operation inside each term.
$= 6 + 14 + 8 + 2$ Add from left to right.
$= 30$

118. This expression has 4 terms.

$\boxed{32 \div (-8)} + \boxed{3 \cdot 7}\boxed{-9}\boxed{-48 \div 12 \cdot 5}$
Outline terms.
$= -4 + 21 - 9\boxed{-4 \cdot 5}$ Do operation inside each term.
$= -4 + 21 - 9 - 20$ Add from left to right.
$= -12$

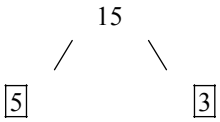
Section R.2 Operations with Fractions

1.



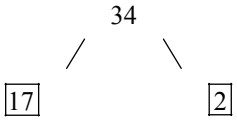
Therefore, $16 = 2 \cdot 2 \cdot 2 \cdot 2$.

2.



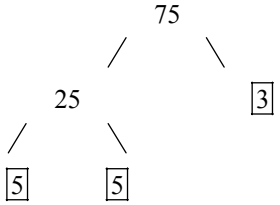
Therefore, $15 = 5 \cdot 3$.

3.



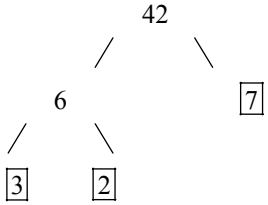
Therefore, $34 = 17 \cdot 2$.

4.



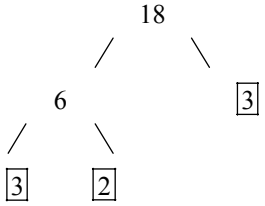
Therefore, $75 = 5 \cdot 5 \cdot 3$.

5.



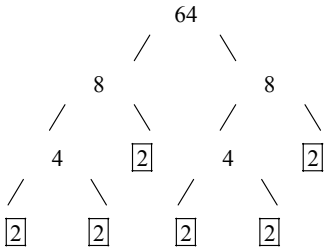
Therefore, $42 = 7 \cdot 3 \cdot 2$.

6.



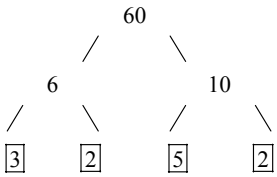
Therefore, $18 = 3 \cdot 3 \cdot 2$.

7.



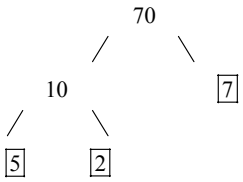
Therefore, $64 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$.

8.



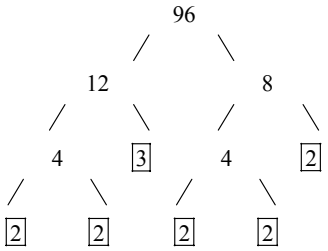
Therefore, $60 = 5 \cdot 3 \cdot 2 \cdot 2$.

9.



Therefore, $70 = 7 \cdot 5 \cdot 2$.

10.



Therefore, $96 = 3 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$.

11. $12 = \boxed{3} \cdot 2 \cdot 2$

$15 = 5 \cdot \boxed{3}$

Only one factor in common, so the GCF is 3.

12. $12 = 3 \cdot \boxed{2} \cdot \boxed{2}$

$20 = 5 \cdot \boxed{2} \cdot \boxed{2}$

The $\text{GCF} = 2 \cdot 2 = 4$

13. $60 = \boxed{5} \cdot \boxed{3} \cdot 2 \cdot 2$

$15 = \boxed{5} \cdot \boxed{3}$

The $\text{GCF} = 5 \cdot 3 = 15$

14. $20 = 5 \cdot \boxed{2} \cdot \boxed{2}$

$36 = 3 \cdot 3 \cdot \boxed{2} \cdot \boxed{2}$

The $\text{GCF} = 2 \cdot 2 = 4$

15. $9 = \boxed{3} \cdot \boxed{3}$

$27 = \boxed{3} \cdot \boxed{3} \cdot 3$

$18 = \boxed{3} \cdot \boxed{3} \cdot 2$

The $\text{GCF} = 3 \cdot 3 = 9$

16. $21 = \boxed{7} \cdot 3$

$49 = \boxed{7} \cdot 7$

$14 = \boxed{7} \cdot 2$

Only one factor in common, so the GCF is 7.

17. $48 = \boxed{3} \cdot \boxed{2} \cdot \boxed{2} \cdot 2 \cdot 2$

$36 = \boxed{3} \cdot 3 \cdot \boxed{2} \cdot \boxed{2}$

$60 = 5 \cdot \boxed{3} \cdot \boxed{2} \cdot \boxed{2}$

The $\text{GCF} = 3 \cdot 2 \cdot 2 = 12$

18. $32 = \boxed{2} \cdot \boxed{2} \cdot \boxed{2} \cdot \boxed{2} \cdot 2$

$64 = \boxed{2} \cdot \boxed{2} \cdot \boxed{2} \cdot \boxed{2} \cdot 2 \cdot 2$

$16 = \boxed{2} \cdot \boxed{2} \cdot \boxed{2} \cdot \boxed{2}$

The $\text{GCF} = 2 \cdot 2 \cdot 2 \cdot 2 = 16$

19. $51 = 17 \cdot \boxed{3}$

$27 = 3 \cdot 3 \cdot \boxed{3}$

Only one factor in common, so the GCF is 3.

20. $72 = \boxed{3} \cdot \boxed{3} \cdot \boxed{2} \cdot 2 \cdot 2$

$18 = \boxed{3} \cdot \boxed{3} \cdot \boxed{2}$

The $\text{GCF} = 3 \cdot 3 \cdot 2 = 18$

21. $\dfrac{6}{15} = \dfrac{\cancel{3} \cdot 2}{5 \cdot \cancel{3}} = \dfrac{2}{5}$

22. $\dfrac{20}{25} = \dfrac{\cancel{5} \cdot 4}{\cancel{5} \cdot 5} = \dfrac{4}{5}$

23. $\dfrac{8}{42} = \dfrac{4 \cdot \cancel{2}}{21 \cdot \cancel{2}} = \dfrac{4}{21}$

24. $\dfrac{9}{33} = \dfrac{3 \cdot \cancel{3}}{11 \cdot \cancel{3}} = \dfrac{3}{11}$

25. $\dfrac{16}{48} = \dfrac{\cancel{16} \cdot 1}{\cancel{16} \cdot 3} = \dfrac{1}{3}$

26. $\dfrac{12}{60} = \dfrac{\cancel{12} \cdot 1}{\cancel{12} \cdot 5} = \dfrac{1}{5}$

27. $-\dfrac{9}{108} = -\dfrac{\cancel{9} \cdot 1}{12 \cdot \cancel{9}} = -\dfrac{1}{12}$

28. $-\dfrac{22}{121} = -\dfrac{\cancel{11} \cdot 2}{\cancel{11} \cdot 11} = -\dfrac{2}{11}$

29. $-5\dfrac{6}{21} = -5\dfrac{\cancel{3} \cdot 2}{7 \cdot \cancel{3}} = -5\dfrac{2}{7}$

30. $-9\dfrac{20}{36} = -9\dfrac{5 \cdot \cancel{4}}{9 \cdot \cancel{4}} = -9\dfrac{5}{9}$

31. Comparing the denominators of 3 and 15, we have that $3 \cdot 5 = 15$. Therefore, we multiply the numerator and denominator by 5.

$$\frac{2 \cdot 5}{3 \cdot 5} = \frac{10}{15}$$

32. Comparing the denominators of 5 and 30, we have that $5 \cdot 6 = 30$. Therefore, we multiply the numerator and denominator by 6.

$$\frac{4 \cdot 6}{5 \cdot 6} = \frac{24}{30}$$

33. Comparing the denominators of 7 and 56, we have that $7 \cdot 8 = 56$. Therefore, we multiply the numerator and denominator by 8.

$$\frac{5 \cdot 8}{7 \cdot 8} = \frac{40}{56}$$

34. Comparing the denominators of 8 and 32, we have that $8 \cdot 4 = 32$. Therefore, we multiply the numerator and denominator by 4.

$$\frac{3 \cdot 4}{8 \cdot 4} = \frac{12}{32}$$

35. Comparing the denominators of 16 and 32, we have that $16 \cdot 2 = 32$. Therefore, we multiply the numerator and denominator by 2.

$$-\frac{5 \cdot 2}{16 \cdot 2} = -\frac{10}{32}$$

36. Comparing the denominators of 15 and 45, we have that $15 \cdot 3 = 45$. Therefore, we multiply the numerator and denominator by 3.

$$-\frac{2 \cdot 3}{15 \cdot 3} = -\frac{6}{45}$$

37. Comparing the denominators of 9 and 45, we have that $9 \cdot 5 = 45$. Therefore, we multiply the numerator and denominator by 5.

$$4\frac{2 \cdot 5}{9 \cdot 5} = 4\frac{10}{45}$$

38. Comparing the denominators of 8 and 40, we have that $8 \cdot 5 = 40$. Therefore, we multiply the numerator and denominator by 5.

$$6\frac{7 \cdot 5}{8 \cdot 5} = 6\frac{35}{40}$$

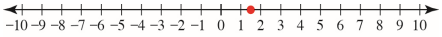
39. Converting 5 to a fraction, $5 = \frac{5}{1}$. Now comparing the denominators of 1 and 3, we have that $1 \cdot 3 = 3$. Therefore, we multiply the numerator and denominator by 3.

$$\frac{5 \cdot 3}{1 \cdot 3} = \frac{15}{3}$$

40. Converting 7 to a fraction, $7 = \frac{7}{1}$. Now comparing the denominators of 1 and 4, we have that $1 \cdot 4 = 4$. Therefore, we multiply the numerator and denominator by 4.

$$\frac{7 \cdot 4}{1 \cdot 4} = \frac{28}{4}$$

41.



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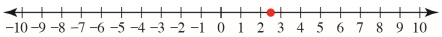

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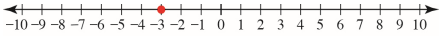

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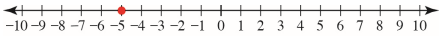

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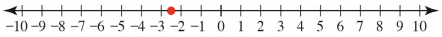

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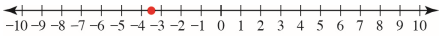
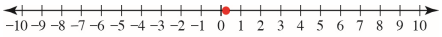
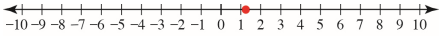


47.



48.



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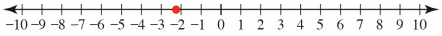
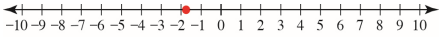


50.



51.

$$\frac{2}{3} + \frac{4}{3}$$ Add the numerators.

$$= \frac{6}{3}$$ Reduce to lowest terms.

$$= 2$$

52.

$$\frac{3}{8} + \frac{5}{8}$$ Add the numerators.

$$= \frac{8}{8}$$ Reduce to lowest terms.

$$= 1$$

53.

$$\frac{7}{5} - \frac{4}{5}$$ Subtract numerators.

$$= \frac{3}{5}$$ Answer is in lowest terms.

54.

$$\frac{11}{14} - \frac{3}{14}$$ Subtract numerators.

$$= \frac{8}{14}$$ Reduce to lowest terms.

$$= \frac{4}{7}$$

55.

$\frac{11}{15}-\frac{2}{15}$ Subtract numerators.

$=\frac{9}{15}$ Reduce to lowest terms.

$=\frac{3}{5}$

56.

$\frac{13}{24}+\frac{5}{24}$ Add numerators.

$=\frac{18}{24}$ Reduce to lowest terms.

$=\frac{3}{4}$

57.

$1\frac{1}{4}+3\frac{3}{4}$ Rewrite mixed numbers as improper fractions.

$=\frac{5}{4}+\frac{15}{4}$ Add numerators.

$=\frac{20}{4}$ Reduce to lowest terms.

$=5$

58.

$4\frac{1}{5}+7\frac{2}{5}$ Rewrite mixed numbers as improper fractions.

$=\frac{21}{5}+\frac{37}{5}$ Add numerators.

$=\frac{58}{5}$ Reduce to lowest terms.

$=11\frac{3}{5}$

59.

$5\frac{2}{3}-2\frac{1}{3}$ Rewrite mixed numbers as improper fractions.

$=\frac{17}{3}-\frac{7}{3}$ Subtract numerators.

$=\frac{10}{3}$ Reduce to lowest terms.

$=3\frac{1}{3}$

60.

$8\frac{1}{6}-3\frac{5}{6}$ Rewrite mixed numbers as improper fractions.

$=\frac{49}{6}-\frac{23}{6}$ Subtract numerators.

$=\frac{26}{6}$ Reduce to lowest terms.

$=4\frac{2}{6}=4\frac{1}{3}$

61. The factorization of 6 is $6 = 3 \cdot 2$ and 3 is prime. The LCD $= 3 \cdot 2 = 6$.

$$\begin{aligned}
&\frac{2}{3} + \frac{5}{6} \\
&= \frac{2 \cdot 2}{3 \cdot 2} + \frac{5}{6} && \text{Rewrite each fraction over LCD.} \\
&= \frac{4}{6} + \frac{5}{6} && \text{Add numerators.} \\
&= \frac{9}{6} && \text{Reduce to lowest terms.} \\
&= \frac{3}{2} \text{ or } 1\frac{1}{2}
\end{aligned}$$

62. The factorization of 4 is $4 = 2 \cdot 2$ and 8 is $8 = 2 \cdot 2 \cdot 2$. The LCD $= 2 \cdot 2 \cdot 2 = 8$.

$$\begin{aligned}
&\frac{1}{4} + \frac{3}{8} \\
&= \frac{1 \cdot 2}{4 \cdot 2} + \frac{3}{8} && \text{Rewrite each fraction over LCD.} \\
&= \frac{2}{8} + \frac{3}{8} && \text{Add numerators.} \\
&= \frac{5}{8} && \text{Answer is in lowest terms.}
\end{aligned}$$

63. The factorization of 8 is $8 = 2 \cdot 2 \cdot 2$ and 3 is prime. The LCD $= 3 \cdot 2 \cdot 2 \cdot 2 = 24$.

$$\begin{aligned}
&-\frac{4}{8} + \frac{1}{3} \\
&= \frac{-4 \cdot 3}{8 \cdot 3} + \frac{1 \cdot 8}{3 \cdot 8} && \text{Rewrite each fraction over LCD.} \\
&= \frac{-12}{24} + \frac{8}{24} && \text{Add/subtract numerators.} \\
&= \frac{-4}{24} && \text{Reduce to lowest terms.} \\
&= -\frac{1}{6}
\end{aligned}$$

64. The factorization of 6 is $6 = 3 \cdot 2$ and 4 is $4 = 2 \cdot 2$. The LCD $= 3 \cdot 2 \cdot 2 = 12$.

$$\begin{aligned}
&-\frac{5}{6} + \frac{1}{4} \\
&= \frac{-5 \cdot 2}{6 \cdot 2} + \frac{1 \cdot 3}{4 \cdot 3} && \text{Rewrite each fraction over LCD.} \\
&= \frac{-10}{12} + \frac{3}{12} && \text{Add/subtract numerators.} \\
&= -\frac{7}{12} && \text{Answer is in lowest terms.}
\end{aligned}$$

65. The factorization of 4 is $4 = 2 \cdot 2$ and 3 is prime. The LCD $= 3 \cdot 2 \cdot 2 = 12$.

$$\begin{aligned}
&-\frac{2}{3} - \frac{3}{4} \\
&= \frac{-2 \cdot 4}{3 \cdot 4} - \frac{3 \cdot 3}{4 \cdot 3} && \text{Rewrite each fraction over LCD.} \\
&= \frac{-8}{12} - \frac{9}{12} && \text{Subtract numerators.} \\
&= -\frac{17}{12} \text{ or } -1\frac{5}{12} && \text{Answer is in lowest terms.}
\end{aligned}$$

66. The factorization of 10 is $10 = 5 \cdot 2$ and 5 is prime. The LCD $= 5 \cdot 2 = 10$.

$$\begin{aligned}
&-\frac{1}{5} - \frac{7}{10} \\
&= \frac{-1 \cdot 2}{5 \cdot 2} - \frac{7}{10} && \text{Rewrite each fraction over LCD.} \\
&= \frac{-2}{10} - \frac{7}{10} && \text{Subtract numerators.} \\
&= -\frac{9}{10} && \text{Answer is in lowest terms.}
\end{aligned}$$

67. The factorization of 6 is $6 = 3 \cdot 2$ and 3 is prime. The LCD $= 3 \cdot 2 = 6$.

$$\begin{aligned}
&1\frac{1}{6} + 3\frac{2}{3} && \text{Rewrite as improper fractions.} \\
&= \frac{7}{6} + \frac{11}{3} \\
&= \frac{7}{6} + \frac{11 \cdot 2}{3 \cdot 2} && \text{Rewrite each fraction over LCD.} \\
&= \frac{7}{6} + \frac{22}{6} && \text{Add numerators.} \\
&= \frac{29}{6} = 4\frac{5}{6} && \text{Answer is in lowest terms.}
\end{aligned}$$

68. Both denominators are prime. The LCD $= 3 \cdot 2 = 6$.

$$\begin{aligned}
&2\frac{1}{3} + 1\frac{1}{2} && \text{Rewrite as improper fractions} \\
&= \frac{7}{3} + \frac{3}{2} \\
&= \frac{7 \cdot 2}{3 \cdot 2} + \frac{3 \cdot 3}{2 \cdot 3} && \text{Rewrite each fraction over LCD.} \\
&= \frac{14}{6} + \frac{9}{6} && \text{Add numerators.} \\
&= \frac{23}{6} = 3\frac{5}{6} && \text{Answer is in lowest terms.}
\end{aligned}$$

69. The factorization of 4 is $4 = 2 \cdot 2$ and 2 is prime. The LCD $= 2 \cdot 2 = 4$.

$-2\frac{1}{4} - 3\frac{1}{2}$ Rewrite as improper fractions.

$= -\frac{9}{4} - \frac{7}{2}$

$= -\frac{9}{4} - \frac{7 \cdot 2}{2 \cdot 2}$ Rewrite each fraction over LCD.

$= -\frac{9}{4} - \frac{14}{4}$ Subtract numerators.

$= -\frac{23}{4} = -5\frac{3}{4}$ Answer is in lowest terms.

70. Both denominators are prime. The LCD $= 5 \cdot 2 = 10$.

$-1\frac{1}{5} - 3\frac{1}{2}$ Rewrite as improper fractions

$= -\frac{6}{5} - \frac{7}{2}$

$= -\frac{6 \cdot 2}{5 \cdot 2} - \frac{7 \cdot 5}{2 \cdot 5}$ Rewrite each fraction over LCD.

$= -\frac{12}{10} - \frac{35}{10}$ Subtract numerators.

$= -\frac{47}{10} = -4\frac{7}{10}$ Answer is in lowest terms.

71. Add the two amounts of paint.

$2\frac{1}{4} + 1\frac{1}{4}$ Rewrite as improper fractions.

$= \frac{9}{4} + \frac{5}{4}$ Add numerators.

$= \frac{14}{4} = 3\frac{2}{4} = 3\frac{1}{2}$ Reduce to lowest terms.

Sandy needs to buy $3\frac{1}{2}$ gallons of paint.

72. Add the two amounts of milk. Looking at the denominators, 3 and 2 are both prime. The LCD $= 3 \cdot 2 = 6$.

$\frac{2}{3} + 1\frac{1}{2}$ Rewrite as improper fractions

$= \frac{2}{3} + \frac{3}{2}$

$= \frac{2 \cdot 2}{3 \cdot 2} + \frac{3 \cdot 3}{2 \cdot 3}$ Rewrite each fraction over LCD.

$= \frac{4}{6} + \frac{9}{6}$ Add numerators.

$= \frac{13}{6} = 2\frac{1}{6}$ Answer is in lowest terms.

James needs a total of $2\frac{1}{6}$ cups of milk.

73. Add the two amounts of salt. Looking at the denominators, the factorization of 4 is $4 = 2 \cdot 2$ and 2 is prime. The LCD $= 2 \cdot 2 = 4$.

$\frac{1}{4} + \frac{1}{2}$

$= \frac{1}{4} + \frac{1 \cdot 2}{2 \cdot 2}$ Rewrite each fraction over LCD.

$= \frac{1}{4} + \frac{2}{4}$ Add numerators.

$= \frac{3}{4}$ Answer is in lowest terms.

Dominique used a total of $\frac{3}{4}$ teaspoon of salt.

74. Add the amounts of molding. Looking at the denominators, they are the same so we do not need to find a LCD. Be sure to include the given length for two sides of the doorway.

$7\frac{3}{4} + 7\frac{3}{4} + 3\frac{1}{4}$ Rewrite as improper fractions

$= \frac{31}{4} + \frac{31}{4} + \frac{13}{4}$ Add numerators.

$= \frac{75}{4} = 18\frac{3}{4}$ Answer is in lowest terms.

The carpenter needs $18\frac{3}{4}$ feet of molding.

75. Subtract the amount he needs from the total amount he has. Looking at the denominators, the factorization of 8 is $8 = 2 \cdot 2 \cdot 2$ and 1 is prime. The LCD $= 2 \cdot 2 \cdot 2 = 8$.

$20 - 10\frac{3}{8}$ Rewrite as improper fractions

$= \frac{20}{1} - \frac{83}{8}$

$= \frac{20 \cdot 8}{1 \cdot 8} - \frac{83}{8}$ Rewrite each fraction over LCD.

$= \frac{160}{8} - \frac{83}{8}$ Subtract numerators.

$= \frac{77}{8} = 9\frac{5}{8}$ Answer is in lowest terms.

Ted will have $9\frac{5}{8}$ feet of lumber left.

76. Subtract the amounts she needs from the total amount she has. Looking at the denominators, the factorization of 4 is $4 = 2 \cdot 2$ and 2 and 1 are both prime. The LCD $= 2 \cdot 2 = 4$.

$$5 - 2\frac{1}{2} - \frac{3}{4}$$ Rewrite as improper fractions

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

$$= \frac{5 \cdot 4}{1 \cdot 4} - \frac{5 \cdot 2}{2 \cdot 2} - \frac{3}{4}$$ Rewrite each fraction over LCD.

$$= \frac{20}{4} - \frac{10}{4} - \frac{3}{4}$$ Subtract numerators.

$$= \frac{7}{4} = 1\frac{3}{4}$$ Answer is in lowest terms.

Hanna will have $1\frac{3}{4}$ pounds of onions left.

77. To find a reciprocal, we invert the fraction. To find the reciprocal of -3, recall that $-3 = \frac{-3}{1}$. Find the reciprocal, which is $-\frac{1}{3}$.

78. Find the reciprocal, which is $-\frac{1}{5}$.

79. Find the reciprocal of $\frac{5}{3}$, which is $\frac{3}{5}$.

80. Find the reciprocal of $\frac{2}{7}$, which is $\frac{7}{2}$.

81. Find the reciprocal of $\frac{1}{9}$, which is $\frac{9}{1} = 9$.

82. Find the reciprocal of $\frac{1}{12}$, which is $\frac{12}{1} = 12$.

83. Find the reciprocal, which is $\frac{1}{8}$.

84. Find the reciprocal, which is $-\frac{1}{2}$.

85. The reciprocal of the number 0 does not exist. If $0 = \frac{0}{1}$ and we invert $\frac{0}{1}$, we would have $\frac{1}{0}$, which is undefined.

86. Find the reciprocal, which is $\frac{1}{1} = 1$.

87.

$$\frac{1}{4} \cdot 8 = \frac{1}{4} \cdot \frac{8}{1}$$

$$= \frac{1 \cdot 8}{4 \cdot 1}$$ Multiply numerators and denominators.

$$= \frac{\cancel{2} \cdot \cancel{2} \cdot 2}{\cancel{2} \cdot \cancel{2}}$$ Factor. Divide out like factors.

$$= \frac{2}{1} = 2$$

88.

$$\frac{2}{3} \cdot 6 = \frac{2}{3} \cdot \frac{6}{1}$$

$$= \frac{2 \cdot 6}{3 \cdot 1}$$ Multiply numerators and denominators.

$$= \frac{\cancel{3} \cdot 2 \cdot 2}{\cancel{3}}$$ Factor. Divide out like factors.

$$= \frac{4}{1} = 4$$

89.

$$-\frac{3}{4} \cdot \left(-\frac{5}{9}\right)$$

$$= \frac{-3 \cdot (-5)}{4 \cdot 9}$$ Multiply numerators and denominators.

$$= \frac{5 \cdot \cancel{3}}{\cancel{3} \cdot 3 \cdot 2 \cdot 2}$$ Factor. Divide out like factors.

$$= \frac{5}{12}$$

90.

$$-\frac{1}{6} \cdot \left(-\frac{12}{5}\right)$$

$$= \frac{-1 \cdot (-12)}{6 \cdot 5}$$ Multiply numerators and denominators.

$$= \frac{\cancel{3} \cdot \cancel{2} \cdot 2}{5 \cdot \cancel{3} \cdot \cancel{2}}$$ Factor. Divide out like factors.

$$= \frac{2}{5}$$

91.

$\frac{2}{3} \div \frac{14}{27}$ Find reciprocal of second fraction and multiply.

$= \frac{2}{3} \cdot \frac{27}{14}$

$= \frac{2 \cdot 27}{3 \cdot 14}$ Factor numerator and denominator.

$= \frac{3 \cdot 3 \cdot \cancel{3} \cdot \cancel{2}}{7 \cdot \cancel{3} \cdot \cancel{2}}$ Divide out like factors.

$= \frac{9}{7}$ or $1\frac{2}{7}$

92.

$\frac{3}{4} \div \frac{9}{16}$ Find reciprocal of second fraction and multiply.

$= \frac{3}{4} \cdot \frac{16}{9}$

$= \frac{3 \cdot 16}{4 \cdot 9}$ Factor numerator and denominator.

$= \frac{\cancel{3} \cdot \cancel{2} \cdot \cancel{2} \cdot 2 \cdot 2}{\cancel{3} \cdot 3 \cdot \cancel{2} \cdot \cancel{2}}$ Divide out like factors.

$= \frac{4}{3}$ or $1\frac{1}{3}$

93.

$(-100) \div (-20)$ Find reciprocal of second fraction and multiply.

$= \frac{-100}{1} \cdot \frac{-1}{20}$

$= \frac{-100 \cdot (-1)}{1 \cdot 20}$ Factor numerator and denominator.

$= \frac{\cancel{5} \cdot 5 \cdot \cancel{2} \cdot \cancel{2}}{\cancel{5} \cdot \cancel{2} \cdot \cancel{2}}$ Divide out like factors.

$= \frac{5}{1} = 5$

94.

$(-36) \div (-12)$ Find reciprocal of second fraction and multiply.

$= \frac{-36}{1} \cdot \frac{-1}{12}$

$= \frac{-36 \cdot (-1)}{1 \cdot 12}$ Factor numerator and denominator.

$= \frac{\cancel{3} \cdot 3 \cdot \cancel{2} \cdot \cancel{2}}{\cancel{3} \cdot \cancel{2} \cdot \cancel{2}}$ Divide out like factors.

$= \frac{3}{1} = 3$

95.

$\frac{4}{15} \div \left(-\frac{8}{45}\right)$ Find reciprocal of second fraction and multiply.

$= \frac{4}{15} \cdot \frac{-45}{8}$

$= \frac{4 \cdot (-45)}{15 \cdot 8}$ Factor numerator and denominator.

$= \frac{-\cancel{5} \cdot \cancel{3} \cdot 3 \cdot \cancel{2} \cdot \cancel{2}}{\cancel{5} \cdot \cancel{3} \cdot 2 \cdot \cancel{2} \cdot \cancel{2}}$ Divide out like factors.

$= -\frac{3}{2}$ or $-1\frac{1}{2}$

96.

$-\frac{2}{5} \div \frac{4}{9}$ Find reciprocal of second fraction and multiply.

$= \frac{-2}{5} \cdot \frac{9}{4}$

$= \frac{-2 \cdot 9}{5 \cdot 4}$ Factor numerator and denominator.

$= \frac{-3 \cdot 3 \cdot \cancel{2}}{5 \cdot 2 \cdot \cancel{2}}$ Divide out like factors.

$= -\frac{9}{10}$

97.

$-\frac{2}{9} \div (-12)$ Find reciprocal of second fraction and multiply.

$= \frac{-2}{9} \cdot \frac{-1}{12}$

$= \frac{-2 \cdot (-1)}{9 \cdot 12}$ Factor numerator and denominator.

$= \frac{\cancel{2}}{3 \cdot 3 \cdot 3 \cdot 2 \cdot \cancel{2}}$ Divide out like factors.

$= \frac{1}{54}$

98.

$-\frac{3}{5} \div (15)$ Find reciprocal of second fraction and multiply.

$= \frac{-3}{5} \cdot \frac{1}{15}$

$= \frac{-3 \cdot 1}{5 \cdot 15}$ Factor numerator and denominator.

$= \frac{-\cancel{3} \cdot 1}{5 \cdot 5 \cdot \cancel{3}}$ Divide out like factors.

$= -\frac{1}{25}$

99. This expression has 2 terms. Simplify inside each term first.

$\boxed{24 \div (-3) \cdot 2} + \boxed{\frac{3}{2}}$ Divide in the first term.

$= -8 \cdot 2 + \frac{3}{2}$ Then multiply in the first term.

$= -16 + \frac{3}{2}$ Find LCD = 2.

$= \frac{-16 \cdot 2}{1 \cdot 2} + \frac{3}{2}$ Rewrite each fraction over the LCD.

$= \frac{-32}{2} + \frac{3}{2}$ Add the two fractions.

$= -\frac{29}{2}$ or $-14\frac{1}{2}$ Fraction is in lowest terms.

100. This expression has 2 terms. Simplify inside each term first.

$\boxed{32 \cdot 2 \div (-8)} + \boxed{\frac{1}{3}}$ Multiply in the first term.

$= 64 \div (-8) + \frac{1}{3}$ Then divide in the first term.

$= -8 + \frac{1}{3}$ Find LCD = 3.

$= \frac{-8 \cdot 3}{1 \cdot 3} + \frac{1}{3}$ Rewrite each fraction over the LCD.

$= \frac{-24}{3} + \frac{1}{3}$ Add the two fractions.

$= -\frac{23}{3}$ or $-7\frac{2}{3}$ Fraction is in lowest terms.

101. This expression has 2 terms. Simplify inside each term first.

$\boxed{3}\boxed{-\frac{1}{3} \div \frac{5}{6}}$ Divide in the second term.

$= 3 - \frac{1}{3} \cdot \frac{6}{5}$ Find reciprocal of second fraction and multiply.

$= 3 - \frac{1 \cdot 6}{3 \cdot 5}$ Factor numerator and denominator.

$= 3 - \frac{\cancel{3} \cdot 2}{5 \cdot \cancel{3}}$ Divide out like factors.

$= 3 - \frac{2}{5}$ Find LCD = 5.

$= \frac{3 \cdot 5}{1 \cdot 5} - \frac{2}{5}$ Rewrite each fraction over the LCD.

$= \frac{15}{5} - \frac{2}{5}$ Subtract the two fractions.

$= \frac{13}{5}$ or $2\frac{3}{5}$ Fraction is in lowest terms.

102. This expression has 2 terms. Simplify inside each term first.

$\boxed{\frac{2}{5} \div \frac{7}{10}}\boxed{-4}$ Divide in the first term.

$= \frac{2}{5} \cdot \frac{10}{7} - 4$ Find reciprocal of second fraction and multiply.

$= \frac{2 \cdot 10}{5 \cdot 7} - 4$ Factor numerator and denominator.

$= \frac{\cancel{5} \cdot 2 \cdot 2}{\cancel{5} \cdot 7} - 4$ Divide out like factors.

$= \frac{4}{7} - 4$ Find LCD = 7.

$= \frac{4}{7} - \frac{4 \cdot 7}{1 \cdot 7}$ Rewrite each fraction over the LCD.

$= \frac{4}{7} - \frac{28}{7}$ Subtract the two fractions.

$= -\frac{24}{7}$ or $-3\frac{3}{7}$ Fraction is in lowest terms.

103. This expression has 3 terms. Simplify inside each term first.

$\boxed{\frac{3}{8} \cdot \frac{4}{5}} + \boxed{\frac{1}{2}}\boxed{-1}$ Multiply in the first term.

$= \frac{3 \cdot 4}{8 \cdot 5} + \frac{1}{2} - 1$ Factor numerator and denominator.

$= \frac{3 \cdot \cancel{2} \cdot \cancel{2}}{\cancel{2} \cdot \cancel{2} \cdot 2 \cdot 5} + \frac{1}{2} - 1$ Divide out like factors.

$= \frac{3}{10} + \frac{1}{2} - 1$ Find LCD = 10.

$= \frac{3}{10} + \frac{1 \cdot 5}{2 \cdot 5} - \frac{1 \cdot 10}{1 \cdot 10}$ Rewrite each fraction over LCD.

$= \frac{3}{10} + \frac{5}{10} - \frac{10}{10}$ Add/Subtract from left to right.

$= \frac{-2}{10} = -\frac{1}{5}$ Reduce to lowest terms.

104. This expression has 3 terms. Simplify inside each term first.

$\boxed{\frac{4}{15} \cdot \frac{3}{2}}\boxed{-\frac{1}{10}} + \boxed{6}$ Multiply in the first term.

$= \frac{4 \cdot 3}{15 \cdot 2} - \frac{1}{10} + 6$ Factor numerator and denominator.

$= \frac{\cancel{3} \cdot \cancel{2} \cdot 2}{5 \cdot \cancel{3} \cdot \cancel{2}} - \frac{1}{10} + 6$ Divide out like factors.

$= \frac{2}{5} - \frac{1}{10} + 6$ Find LCD = 10.

$= \frac{2 \cdot 2}{5 \cdot 2} - \frac{1}{10} + \frac{6 \cdot 10}{1 \cdot 10}$ Rewrite each fraction over LCD.

$= \frac{4}{10} - \frac{1}{10} + \frac{60}{10}$ Add/Subtract from left to right.

$= \frac{63}{10}$ or $6\frac{3}{10}$ Fraction is in lowest terms.

105. This expression has 3 terms. Simplify inside each term first.

$\boxed{\frac{5}{8}\cdot\frac{4}{15}}+\boxed{\frac{1}{2}\cdot\frac{3}{2}}+\boxed{2}$ Multiply in the first and second terms.

$=\frac{5\cdot 4}{8\cdot 15}+\frac{1\cdot 3}{2\cdot 2}+2$ Factor numerators and denominators.

$=\frac{\cancel{5}\cdot\cancel{2}\cdot\cancel{2}}{\cancel{5}\cdot 3\cdot\cancel{2}\cdot\cancel{2}\cdot 2}+\frac{1\cdot 3}{2\cdot 2}+2$ Divide out like factors.

$=\frac{1}{6}+\frac{3}{4}+2$ Find LCD = 12.

$=\frac{1\cdot 2}{6\cdot 2}+\frac{3\cdot 3}{4\cdot 3}+\frac{2\cdot 12}{1\cdot 12}$ Rewrite each fraction over LCD.

$=\frac{2}{12}+\frac{9}{12}+\frac{24}{12}$ Add/Subtract from left to right.

$=\frac{35}{12}$ or $2\frac{11}{12}$ Fraction is in lowest terms.

106. This expression has 3 terms. Simplify inside each term first.

$\boxed{\frac{3}{4}\cdot\frac{5}{9}}+\boxed{\frac{2}{3}\cdot\frac{7}{8}}\boxed{-3}$ Multiply in the first and second terms.

$=\frac{3\cdot 5}{4\cdot 9}+\frac{2\cdot 7}{3\cdot 8}-3$ Factor numerators and denominators.

$=\frac{5\cdot\cancel{3}}{\cancel{3}\cdot 3\cdot 2\cdot 2}+\frac{7\cdot\cancel{2}}{3\cdot 2\cdot 2\cdot\cancel{2}}-3$ Divide out like factors.

$=\frac{5}{12}+\frac{7}{12}-3$ Find LCD = 12.

$=\frac{5}{12}+\frac{7}{12}-\frac{3\cdot 12}{1\cdot 12}$ Rewrite each fraction over LCD.

$=\frac{5}{12}+\frac{7}{12}-\frac{36}{12}$ Add/Subtract from left to right.

$=-\frac{24}{12}=-2$ Fraction is in lowest terms.

107. This expression has 1 term. Simplify inside each term first.

$\frac{4}{9}\div\frac{5}{18}\cdot\frac{3}{2}$ Divide first.

$=\frac{4}{9}\cdot\frac{18}{5}\cdot\frac{3}{2}$ Find reciprocal of second fraction and multiply.

$=\frac{4\cdot 18}{9\cdot 5}\cdot\frac{3}{2}$ Factor numerators and denominators.

$=\frac{\cancel{3}\cdot\cancel{3}\cdot 2\cdot 2\cdot\cancel{2}}{5\cdot\cancel{3}\cdot\cancel{3}}\cdot\frac{3}{\cancel{2}}$ Divide out like factors.

$=\frac{12}{5}$ or $2\frac{2}{5}$ Fraction is in lowest terms.

108. This expression has 1 term. Simplify inside each term first.

$\frac{4}{7} \div \frac{3}{14} \cdot \frac{9}{16}$ Divide first.

$= \frac{4}{7} \cdot \frac{14}{3} \cdot \frac{9}{16}$ Find reciprocal of second fraction and multiply.

$= \frac{4 \cdot 14}{7 \cdot 3} \cdot \frac{9}{16}$ Factor numerators and denominators.

$= \frac{\cancel{7} \cdot \cancel{2} \cdot \cancel{2} \cdot \cancel{2}}{\cancel{7} \cdot \cancel{3}} \cdot \frac{\cancel{3} \cdot 3}{\cancel{2} \cdot \cancel{2} \cdot \cancel{2} \cdot 2}$ Divide out like factors.

$= \frac{3}{2}$ or $1\frac{1}{2}$ Fraction is in lowest terms.

Section R.3 Operations with Decimals

1. The digit in the tenths place is 4. $0.\boxed{4}732$

2. The digit in the tenths place is 0. $1.\boxed{0}943$

3. The digit in the ten-thousandths place is 4. $6.915\boxed{4}$

4. The digit in the ten-thousandths place is 0. $4.615\boxed{0}7$

5. The digit in the ones place is 7. $\boxed{7}.25$

6. The digit in the ones place is 8. $\boxed{8}.91$

7. The digit in the hundredths place is 8. $6.2\boxed{8}01$

8. The digit in the hundredths place is 0. $0.0\boxed{0}541$

9. The digit in the thousandths place is 0. $8.95\boxed{0}4$

10. The digit in the thousandths place is 7. $3.29\boxed{7}4$

11. The number 2.9 is written in words as two and 9 tenths. Writing 2.9 in fraction form gives

$2.9 = 2\frac{9}{10}$ Write the decimal part in fraction form.

$= 2\frac{9}{10}$ Fraction is in lowest terms.

12. The number 3.7 is written in words as three and 7 tenths. Writing 3.7 in fraction form gives

$3.7 = 3\frac{7}{10}$ Write the decimal part in fraction form.

$= 3\frac{7}{10}$ Fraction is in lowest terms.

13. The number 0.84 is written in words as 84 hundredths. Writing 0.84 in fraction form gives

$0.84 = \frac{84}{100}$ Write the decimal part in fraction form.

$= \frac{21}{25}$ Reduce to lowest terms.

14. The number 0.42 is written in words as 42 hundredths. Writing 0.42 in fraction form gives

$0.42 = \frac{42}{100}$ Write the decimal part in fraction form.

$= \frac{21}{50}$ Reduce to lowest terms.

15. The number 7.71 is written in words as seven and 71 hundredths. Writing 7.71 in fraction form gives

$7.71 = 7\frac{71}{100}$ Write the decimal part in fraction form.

$= 7\frac{71}{100}$ Fraction is in lowest terms.

16. The number 5.23 is written in words as five and 23 hundredths. Writing 5.23 in fraction form gives

$5.23 = 5\frac{23}{100}$ Write the decimal part in fraction form.

$= 5\frac{23}{100}$ Fraction is in lowest terms.

17. The number 1.008 is written in words as one and 8 thousandths. Writing 1.008 in fraction form gives

$1.008 = 1\frac{8}{1000}$ Write the decimal part in fraction form.

$= 1\frac{1}{125}$ Reduce to lowest terms.

18. The number 2.014 is written in words as two and 14 thousandths. Writing 2.014 in fraction form gives

$2.014 = 2\frac{14}{1000}$ Write the decimal part in fraction form.

$= 2\frac{7}{500}$ Reduce to lowest terms.

19. The number 1.33 is written in words as one and 33 hundredths. Writing 1.33 in fraction form gives

$1.33 = 1\frac{33}{100}$ Write the decimal part in fraction form.

$= 1\frac{33}{100}$ Fraction is in lowest terms.

20. The number 2.67 is written in words as two and 67 hundredths. Writing 2.67 in fraction form gives

$2.67 = 2\frac{67}{100}$ Write the decimal part in fraction form.

$= 2\frac{67}{100}$ Fraction is in lowest terms.

21. To convert $\frac{3}{5}$ to decimal form, use long division. $\frac{3}{5}$ means $5\overline{)3}$. Since 3 is less than 5, add a decimal point and continue dividing.

$$\begin{array}{r} 0.6 \\ 5\overline{)3.0} \\ \underline{-30} \\ 0 \end{array}$$

Therefore, $\frac{3}{5} = 0.6$.

22. To convert $\frac{1}{5}$ to decimal form, use long division. $\frac{1}{5}$ means $5\overline{)1}$. Since 1 is less than 5, add a decimal point and continue dividing.

$$\begin{array}{r} 0.2 \\ 5\overline{)1.0} \\ \underline{-10} \\ 0 \end{array}$$

Therefore, $\frac{1}{5} = 0.2$.

23. To convert $1\frac{1}{4}$ to decimal form, first convert to the improper fraction $\frac{5}{4}$ then use long division.

$\frac{5}{4}$ means $4\overline{)5}$. Add a decimal point and continue dividing.

$$\begin{array}{r} 1.25 \\ 4\overline{)5.00} \\ \underline{-4} \\ 10 \\ \underline{-8} \\ 20 \\ \underline{-20} \\ 0 \end{array}$$

Therefore, $1\frac{1}{4} = 1.25$.

24. To convert $3\frac{3}{4}$ to decimal form, first convert to the improper fraction $\frac{15}{4}$ then use long division.

$\frac{15}{4}$ means $4\overline{)15}$. Add a decimal point and continue dividing.

$$\begin{array}{r} 3.75 \\ 4\overline{)15.00} \\ \underline{-12} \\ 30 \\ \underline{-28} \\ 20 \\ \underline{-20} \\ 0 \end{array}$$

Therefore, $3\frac{3}{4} = 3.75$.

25. To convert $\frac{5}{12}$ to decimal form, use long division. $\frac{5}{12}$ means $12\overline{)5}$. Since 5 is less than 12, add a decimal point and continue dividing.

$$\begin{array}{r} 0.4166... \\ 12\overline{)5.00000} \\ \underline{-48} \\ 20 \\ \underline{-12} \\ 80 \\ \underline{-72} \\ 80 \\ \underline{-72} \\ 80 \end{array}$$

Therefore, $\frac{5}{12} = 0.41\overline{6}$.

26. To convert $\frac{7}{12}$ to decimal form, use long division. $\frac{7}{12}$ means $12\overline{)7}$. Since 7 is less than 12, add a decimal point and continue dividing.

$$\begin{array}{r} 0.5833.. \\ 12\overline{)7.00000} \\ \underline{-60} \\ 100 \\ \underline{-96} \\ 40 \\ \underline{-36} \\ 40 \\ \underline{-36} \\ 40 \end{array}$$

Therefore, $\frac{7}{12} = 0.58\overline{3}$.

27. To convert $3\frac{1}{6}$ to decimal form, first convert to the improper fraction $\frac{19}{6}$ then use long division.

$\frac{19}{6}$ means $6\overline{)19}$. Add a decimal point and continue dividing.

$$\begin{array}{r} 3.166.. \\ 6\overline{)19.0000} \\ \underline{-18} \\ 10 \\ \underline{-6} \\ 40 \\ \underline{-36} \\ 40 \\ \underline{-36} \\ 4 \end{array}$$

Therefore, $\frac{19}{6} = 3.1\overline{6}$.

28. To convert $4\frac{2}{3}$ to decimal form, first convert to the improper fraction $\frac{14}{3}$ then use long division.

$\frac{14}{3}$ means $3\overline{)14}$. Add a decimal point and continue dividing.

$$\begin{array}{r} 4.66.. \\ 3\overline{)14.000} \\ \underline{-12} \\ 20 \\ \underline{-18} \\ 20 \\ \underline{-18} \\ 2 \end{array}$$

Therefore, $\frac{14}{3} = 4.\overline{6}$.

29. To convert $\frac{7}{8}$ to decimal form, use long division. $\frac{7}{8}$ means $8\overline{)7}$. Since 7 is less than 8, add a decimal point and continue dividing.

$$\begin{array}{r} 0.875 \\ 8\overline{)7.000} \\ \underline{-64} \\ 60 \\ \underline{-56} \\ 40 \\ \underline{-40} \\ 0 \end{array}$$

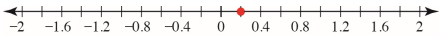
Therefore, $\frac{7}{8} = 0.875$.

30. To convert $\frac{1}{8}$ to decimal form, use long division. $\frac{1}{8}$ means $8\overline{)1}$. Since 1 is less than 8, add a decimal point and continue dividing.

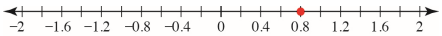
$$\begin{array}{r} 0.125 \\ 8\overline{)1.000} \\ \underline{-8} \\ 20 \\ \underline{-16} \\ 40 \\ \underline{-40} \\ 0 \end{array}$$

Therefore, $\frac{1}{8} = 0.125$.

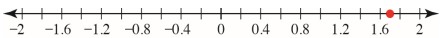
31.



32.



33. 1.7 lies halfway between 1.6 and 1.8.



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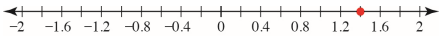
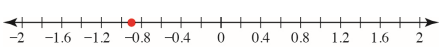
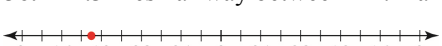


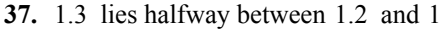
35. -0.9 lies halfway between -1.0 and -0.8.



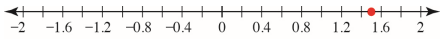
36. -1.3 lies halfway between -1.4 and -1.2.



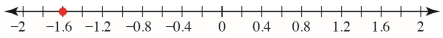
37. 1.3 lies halfway between 1.2 and 1.4.



38. 1.5 lies halfway between 1.4 and 1.6.



39.



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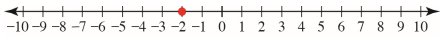

41. Round 8.25 to the tenths place.

8.2̲5 Underline the tenths place.
The next digit to the right is 5.
8.3 Round up 1. $2+1=3$

42. Round 6.27 to the tenths place.

6.2̲7 Underline the tenths place.
The next digit to the right is 7.
6.3 Round up 1. $2+1=3$

43. Round 9.207 to the hundredths place.

9.20̲7 Underline the hundredths place.
The next digit to the right is 7.
9.21 Round up 1. $0+1=1$

44. Round 13.029 to the hundredths place.

13.02̲9 Underline the hundredths place.
The next digit to the right is 9.
13.03 Round up 1. $2+1=3$

45. Round 205.69 to the tens place.

20̲5.69 Underline the tens place.
The next digit to the right is 5.
210 Round up 1. $0+1=1$

46. Round 127.995 to the tens place.

12̲7.995 Underline the tens place.
The next digit to the right is 7.
130 Round up 1. $2+1=3$

47. Round 0.12999 to the tenths place.

0.1̲2999 Underline the tenths place.
The next digit to the right is 2.
0.1 Round down.

48. Round 5.34997 to the tenths place.

5.3̲4997 Underline the tenths place.
The next digit to the right is 4.
5.3 Round down.

49. Round 0.99 to the ones place.

0̲.99 Underline the ones place.
The next digit to the right is 9.
1 Round up 1. $0+1=1$

50. Round 4.62 to the ones place.

4̲.62 Underline the ones place.
The next digit to the right is 6.
5 Round up 1. $4+1=5$

51. Round 4.32601 to the thousandths place.

4.326̲01 Underline the thousandths place.
The next digit to the right is 0.
4.326 Round down.

52. Round 9.99219 to the thousandths place.

9.992̲19 Underline the thousandths place.
The next digit to the right is 1.
9.992 Round down.

53. Round 6.51757 to the ten-thousandths place.

6.5175̲7 Underline the ten-thousandths place.
The next digit to the right is 7.
6.5176 Round up 1. $5+1=6$

54. Round 4.593217 to the ten-thousandths place.

4.593̲217 Underline the ten-thousandths place.
The next digit to the right is 1.
4.5932 Round down.

55. Write the problem vertically, carefully matching place values, and add.

$$\begin{array}{r} 2.75 \\ +3.01 \\ \hline 5.76 \end{array}$$

56. Write the problem vertically, carefully matching place values, and add.

$$\begin{array}{r} 6.14 \\ +9.73 \\ \hline 15.87 \end{array}$$

57. Write the problem vertically, carefully matching place values, and subtract.

$$\begin{array}{r} {}^{5} \\ 8.\not{6}\,{}^{1}8 \\ -1.39 \\ \hline 7.29 \end{array}$$

58. Write the problem vertically, carefully matching place values, and subtract.

$$\begin{array}{r} 10.\cancel{7}^{\,6}\,\cancel{0}^{\,9}\,{}^{1}1 \\ -3.334 \\ \hline 7.367 \end{array}$$

59. Write the problem vertically, carefully matching place values, and add.

$$\begin{array}{r} 96.3710 \\ +0.2275 \\ \hline 96.5985 \end{array}$$

60. Write the problem vertically, carefully matching place values, and add.

$$\begin{array}{r} {}^{1} \\ 16.9027 \\ +9.0170 \\ \hline 25.9197 \end{array}$$

61. Write the problem vertically, carefully matching place values, and subtract.

$$\begin{array}{r} \cancel{9}^{\,8}.\,\cancel{1}^{\,9}\,{}^{1}0 \\ -3.67 \\ \hline 5.33 \end{array}$$

62. Write the problem vertically, carefully matching place values, and subtract.

$$\begin{array}{r} 1\cancel{6}^{\,5}.\,\cancel{1}^{\,9}\,\cancel{0}^{\,9}\,{}^{1}0 \\ -2.994 \\ \hline 13.006 \end{array}$$

63. Write the problem vertically, carefully matching place values, and subtract.

$$\begin{array}{r} 9.7\cancel{5}^{\,4}\,{}^{1}0 \\ -3.001 \\ \hline 6.749 \end{array}$$

64. Write the problem vertically, carefully matching place values, and subtract.

$$\begin{array}{r} 1\cancel{6}^{\,5}.\,\cancel{1}^{\,11}2\,\cancel{0}^{\,9}\,{}^{1}0 \\ -5.447 \\ \hline 10.753 \end{array}$$

65. To find the total cost of Michelle's 2 books, add the two amounts together.

$$\begin{array}{r} {}^{1\,1\,1} \\ \$149.95 \\ +\$124.95 \\ \hline \$274.90 \end{array}$$

The two books cost Michelle $274.90.

66. To find the total cost of Jorge's books for his Math and Reading courses, add the two amounts together.

$$\begin{array}{r} {}^{1\,1\,1} \\ \$120.95 \\ +\$95.99 \\ \hline \$216.94 \end{array}$$

The two books cost Jorge $216.94.

67. To find the amount of change Rani received, find the total cost of her purchases by adding the two amounts together then subtract the total from $20.

$$\begin{array}{r} \$4.00 \\ +\$6.50 \\ \hline \$10.50 \end{array}$$

Now subtract the total from $20.

$$\begin{array}{r} \$\cancel{2}^{\,1}\,\cancel{0}^{\,9}.\,{}^{1}00 \\ -\ \$10.50 \\ \hline \$9.50 \end{array}$$

Rani received $9.50 in change.

68. To find the amount of change Ransi received, find the total cost of his purchases by adding the two amounts together then subtract the total from $20.

$$\begin{array}{r} {}^{1} \\ \$5.50 \\ +\$2.50 \\ \hline \$8.00 \end{array}$$

Now subtract the total from $20.

$$\begin{array}{r} \$\cancel{2}^{\,1}\,{}^{1}0.00 \\ -\ \$8.00 \\ \hline \$12.00 \end{array}$$

Rani received $12.00 in change.

69. Multiply the numbers as if they were two integers, ignoring the decimal places until you reach the final answer.

$$\begin{array}{r} 3.01 \\ \times 1.8 \\ \hline 2408 \\ +3010 \\ \hline 5.418 \end{array}$$

The numbers 3.01 and 1.8 have a total of 3 digits after the decimal point. Move the decimal point from the right over 3 digits to get the solution 5.418.

70. Multiply the numbers as if they were two integers, ignoring the decimal places until you reach the final answer.

$$\begin{array}{r} 2.01 \\ \times 8.3 \\ \hline 603 \\ +16080 \\ \hline 16.683 \end{array}$$

The numbers 2.01 and 8.3 have a total of 3 digits after the decimal point. Move the decimal point from the right over 3 digits to get the solution 16.683.

71. Multiply the numbers as if they were two integers, ignoring the decimal places until you reach the final answer.

$$\begin{array}{r} {\scriptstyle 2\ \ } \\ 6.0\overset{}{7} \\ \times 3.5 \\ \hline {\scriptstyle 1}\ 3035 \\ +18210 \\ \hline 21.245 \end{array}$$

The numbers 3.5 and 6.07 have a total of 3 digits after the decimal point. Move the decimal point from the right over 3 digits to get the solution 21.245.

72. Multiply the numbers as if they were two integers, ignoring the decimal places until you reach the final answer.

$$\begin{array}{r} {\scriptstyle 1\ 2} \\ 1.2\overset{}{4} \\ \times 5.7 \\ \hline {\scriptstyle 1}\ 868 \\ +6200 \\ \hline 7.068 \end{array}$$

The numbers 5.7 and 1.24 have a total of 3 digits after the decimal point. Move the decimal point from the right over 3 digits to get the solution 7.068.

73. Multiply the numbers as if they were two integers, ignoring the decimal places until you reach the final answer.

$$\begin{array}{r} {\scriptstyle 1\ 4} \\ 0.0\overset{}{1}6 \\ \times 7 \\ \hline 0.112 \end{array}$$

The numbers 7 and 0.016 have a total of 3 digits after the decimal point. Move the decimal point from the right over 3 digits to get the solution 0.112.

74. Multiply the numbers as if they were two integers, ignoring the decimal places until you reach the final answer.

$$\begin{array}{r} {\scriptstyle 3\ 5} \\ 5.0\overset{}{4}7 \\ \times 8 \\ \hline 40.376 \end{array}$$

The numbers 5.047 and 8 have a total of 3 digits after the decimal point. Move the decimal point from the right over 3 digits to get the solution 40.376.

75. The amount you spend for downloading three apps costing \$0.99 each can be calculated as $3(0.99)$.

$$\begin{array}{r} {\scriptstyle 2\ 2} \\ 0.9\overset{}{9} \\ \times 3 \\ \hline 2.97 \end{array}$$

The cost for three apps is \$2.97.

76. The amount you spend for downloading six apps costing \$0.99 each can be calculated as $6(0.99)$.

$$\begin{array}{r} {\scriptstyle 5\ 5} \\ 0.9\overset{}{9} \\ \times 6 \\ \hline 5.94 \end{array}$$

The cost for six apps is \$5.94.

77. The amount Sam spent for three candy bars costing \$0.65 each can be calculated as $3(0.65)$.

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 0.6\overset{}{5} \\ \times 3 \\ \hline 1.95 \end{array}$$

Sam spent \$1.95 for three candy bars.

78. The amount Brogan spent for two blouses costing \$23.75 each can be calculated as $2(23.75)$.

$$\begin{array}{r} {\scriptstyle 1\ 1}\\ 23.75\\ \times 2\\ \hline 47.50 \end{array}$$

Brogan spent \$47.50 for two blouses.

79.

$8.2 \div 0.01$ Write in long-division form.

$0.01\overline{)8.2}$ Move the decimal point on 0.01 and 8.2 two places to the right.

$1\overline{)820.}$ Perform long division.

$$\begin{array}{r} 820\\ -8\\ \hline 02\\ -2\\ \hline 00 \end{array}$$

80.

$6.95 \div 0.01$ Write in long-division form.

$0.01\overline{)6.95}$ Move the decimal point on 0.01 and 6.95 two places to the right.

$1\overline{)695.}$ Perform long division.

$$\begin{array}{r} 695\\ -6\\ \hline 09\\ -9\\ \hline 05\\ -5\\ \hline 0 \end{array}$$

81.

$0.12 \div 2$ Write in long-division form.

$2\overline{)0.12}$ The decimal does not need to be moved.

$2\overline{)0.12}$ Perform long division.

$$\begin{array}{r} 0.06\\ -0\\ \hline 01\\ -0\\ \hline 12\\ -12\\ \hline 0 \end{array}$$

82.

$0.81 \div 9$ Write in long-division form.

$9\overline{)0.81}$ The decimal does not need to be moved.

$9\overline{)0.81}$ Perform long division.

$$\begin{array}{r} 0.09\\ -0\\ \hline 08\\ -0\\ \hline 81\\ -81\\ \hline 0 \end{array}$$

83.

$19.32 \div 2.3$ Write in long-division form.

$2.3\overline{)19.32}$ Move the decimal point on 2.3 and 19.32 one place to the right.

$23\overline{)193.2}$ Perform long division.

$$\begin{array}{r} 8.4\\ -184\\ \hline 92\\ -92\\ \hline 0 \end{array}$$

84.

$57.34 \div 6.1$ Write in long-division form.

$6.1\overline{)57.34}$ Move the decimal point on 6.1 and 57.34 one place to the right.

$61\overline{)573.4}$ Perform long division.

$$\begin{array}{r} 9.4\\ -549\\ \hline 244\\ -244\\ \hline 0 \end{array}$$

85.

$0.01073 \div 0.29$ Write in long-division form.

$0.29\overline{)0.01073}$ Move the decimal point on 0.29 and 0.01073 two places to the right.

$29\overline{)1.073}$ Perform long division.

$$\begin{array}{r} 0.037\\ -87\\ \hline 203\\ -203\\ \hline 0 \end{array}$$

86.

$0.09144 \div 0.36$ Write in long-division form.

$0.36\overline{)0.09144}$ Move the decimal point on 0.36 and 0.09144 two places to the right.

$36\overline{)9.144}$ Perform long division.

$$\begin{array}{r} 0.254\\ -72\\ \hline 194\\ -180\\ \hline 144\\ -144\\ \hline 0 \end{array}$$

87. The two terms are identified by being outlined. Simplify inside each term first.

$\boxed{4.2} + \boxed{1.5 \cdot 6.1}$ Multiply in the 2nd term.

$= 4.2 + 9.15$ Add the two terms.

$= 13.35$

88. The two terms are identified by being outlined. Simplify inside each term first.

$\boxed{9.7 \cdot 2.3} + \boxed{7.1}$ Multiply in the 1st term.
$= 22.31 + 7.1$ Add the two terms.
$= 29.41$

89. The two terms are identified by being outlined. Simplify inside each term first.

$\boxed{4(8.95)}\boxed{-16.23}$ Multiply in the 1st term.
$= 35.8 - 16.23$ Subtract.
$= 19.57$

90. The two terms are identified by being outlined. Simplify inside each term first.

$\boxed{7(1.02)}\boxed{-21.54}$ Multiply in the 1st term.
$= 7.14 - 21.54$ Subtract.
$= -14.4$

91. The three terms are identified by being outlined. Simplify inside each term first.

$\boxed{4.6} + \boxed{8 \div 2.5}\boxed{-22.1}$ Divide in the 2nd term.
$= 4.6 + 3.2 - 22.1$ Add then subtract.
$= -14.3$

92. The three terms are identified by being outlined. Simplify inside each term first.

$\boxed{-3.7} + \boxed{10 \div 1.6} + \boxed{8.1}$ Divide in 2nd term.
$= -3.7 + 6.25 + 8.1$ Add/subtract from left to right.
$= 10.65$

93. The three terms are identified by being outlined. Simplify inside each term first.

$\boxed{-12.3} + \boxed{5 \div 0.1} + \boxed{9.72}$ Divide in 2nd term.
$= -12.3 + 50 + 9.72$ Add/subtract from left to right.
$= 47.42$

94. The three terms are identified by being outlined. Simplify inside each term first.

$\boxed{18.7} + \boxed{28 \div 0.1}\boxed{-14.25}$ Divide in 2nd term.
$= 18.7 + 280 - 14.25$ Add/subtract from left to right.
$= 284.45$

95. There is only one term in this expression.

$\boxed{24 \div 1.5 \cdot 8.4}$ Division is the first operation.
$= 16 \cdot 8.4$ Then multiply.
$= 134.4$

96. There is only one term in this expression.

$\boxed{20 \div 0.25 \cdot 0.61}$ Division is the first operation.
$= 80 \cdot 0.61$ Then multiply.
$= 48.8$

97. a. To find an expression that gives the total cost of Luc's purchase, add each of the items together. Remember Luc is purchasing 2 packages of gum so we will need to multiply that cost by 2. The expression is

1.75 + 0.99 + 2(2.98)

b. This expression contains the operations of addition and multiplication.

c. This expression has 3 terms (the terms are separated by addition).

d. Using the order-of-operations agreement, multiplication should be done first, then addition.

e.

1.75 + 0.99 + 2(2.98)
= 1.75 + 0.99 + 5.96
= 8.70

The total amount of Luc's purchase is \$8.70.

98. a. To find an expression that gives the total cost of Van's purchase, add each of the items together. Remember Van is purchasing 2 sodas and 2 popcorns so we will need to multiply the cost of those items by 2 before adding all of the items together. The expression is

2(4.00) + 5.25 + 2(5.00)

b. This expression contains the operations of addition and multiplication.

c. This expression has 3 terms (the terms are separated by addition).

d. Using the order-of-operations agreement, multiplication should be done first, then addition.

e.

2(4.00) + 5.25 + 2(5.00)
= 8.00 + 5.25 + 10.00
= 23.25

The total amount of Van's purchase is \$23.25.