Rising Seventh Graders Math Packet

Name: _____

Part 1 – Ratios and Proportional Relationships

1.1 Writing, Reducing, and Comparing Ratios

1. *Draw*. Represent circles and squares with a ratio of 5:7.

2. *Solve*. Divide $1,200 into a 2:3 ratio.

3. Use the table to create a ratio of Spotify to Apple Music users.

Music Service	6th Graders	7th Graders
Spotify	45	60
Apple Music	50	71

_____ Spotify Users : _____ Apple Music users

4. Reduce the ratios.
   a. 4:12 ____:_____

   b. 42:22 ____:_____

5. Use >, < or = to compare the ratios
   a. 1:3 _____6:18
   b. 2:10 _____2:12
   c. 4:16 _____4:20

1.2 Finding Unit Rates

Example: Unit rates make comparisons to a single unit. 4 burgers for $16.00 is equal to $4.00 per burger. This is done by dividing the total cost by the parts that contribute to it.

6. Find the unit rate for each problem.
    a. 25 books are distributed into 5 shopping bags. _____ books per bag.

    b. It takes 10 hours to drive 500 miles. _____ miles per hour.

7. During a blizzard, it snows 6 inches every hour. How much does it snow per minute?

    _____ inches per minute.

8. George is buying potato chips at a grocery store. He can either spend $7.93 on a 15.25 ounce bag or $11.75 on a 25 ounce bag. Which is a better buy? Show your reasoning.

9. Use a table to solve the problems below.

    a. If it costs $4.00 to buy two hotdogs, how much will it cost to buy 10 hotdogs?

Number of hotdogs	**2**	**4**	**6**	**8**	**10**
Cost					

    b. A student is reading a 48 page book. If they read at a rate of 8 pages every 15 minutes, how long will it take them to finish the book?

Pages read	**8**					
Time past	**15**					

1.3 Proportions

10. *Solve the proportion.* 24 loaves of bread cost $48. How much does 10 loaves cost? Show your work.

11. Determine whether the given pairs are equivalent proportions.
    a. $\frac{7}{15}\ and\ \frac{14}{45}$ _____
    b. $\frac{5}{6}\ and\ \frac{20}{24}$ _____
    c. $\frac{8}{3}\ and\ \frac{32}{12}$ _____

1.4 Percentages

12. Write 123 as a percent.

13. What is 60% of 1,000?

14. What percent of 96 is 30? Round to the nearest tenth.

15. 23% of people at a concert buy a soda. Write this percent as a fraction.

16. There are 80 seventh graders are members of the music program. 20% are in the orchestra and 45% are in the concert band. The remaining students are in choir. How many students are in choir?

17. What is 8.34 as a percent?

18. What is 20% of 10?

19. Write $\frac{1}{3}$ as a percent. Round to the nearest tenth if necessary.

20. Write $\frac{5}{9}$ as a percent. Round to the nearest tenth if necessary.

Part 2 - Operations with Fractions & Decimals

2.1 Dividing Fractions

Find the quotient. Simplify/reduce answers when possible.

21. $8 \div \frac{1}{8} =$

22. $7 \div \frac{2}{4} =$

23. $9 \div \frac{2}{10} =$

24. $1 \div \frac{5}{10} =$

25. $\frac{8}{10} \div \frac{1}{3} =$

26. $\frac{1}{7} \div \frac{2}{10} =$

27. $\frac{5}{6} \div \frac{2}{3} =$

28. $5\frac{3}{5} \div \frac{1}{5} =$

29. $15\frac{2}{3} \div \frac{1}{3} =$

30. $10\frac{1}{3} \div \frac{1}{3} =$

31. $9\frac{11}{12} \div \frac{3}{12} =$

2.2 Adding & Subtracting with Decimals

32.

$$\begin{array}{r} 0.007 \\ +\ 0.028 \\ \hline \end{array}$$

33.

$$\begin{array}{r} 44.5300 \\ +\ \ 0.0005 \\ \hline \end{array}$$

34.

$$\begin{array}{r} 0.0626 \\ +\ 0.6000 \\ \hline \end{array}$$

35.

$$\begin{array}{r} 83.1200 \\ +\ \ 0.0066 \\ \hline \end{array}$$

36.

$$\begin{array}{r} 0.007 \\ +\ 0.028 \\ \hline \end{array}$$

37.

$$\begin{array}{r} 90.0000 \\ -\ 0.0260 \\ \hline \end{array}$$

38.

$$\begin{array}{r} 0.100 \\ -\ 0.019 \\ \hline \end{array}$$

39.

$$\begin{array}{r} 0.00300 \\ -\ 0.00035 \\ \hline \end{array}$$

40.

$$\begin{array}{r} 80.0 \\ -\ 8.7 \\ \hline \end{array}$$

41.

$$\begin{array}{r} 0.800 \\ -\ 0.059 \\ \hline \end{array}$$

2.3 Multiplying with Decimals.

Find the product.

42.

$$\begin{array}{r} 3.000 \\ \times\ 0.008 \\ \hline \end{array}$$

43.

$$\begin{array}{r} 10.00 \\ \times\ 0.08 \\ \hline \end{array}$$

44.

$$\begin{array}{r} 0.3 \\ \times\ 0.3 \end{array}$$

45.

$$\begin{array}{r} 0.07 \\ \times\ 0.20 \end{array}$$

2.4 LCM and GCF.

Find the least common multiple (LCM) of each pair.

46. The LCM of 3 and 4 is _____

47. The LCM of 12 and 18 is _____

48. The LCM of 8 and 5 is _____

Find the greatest common factor (GCF) of each pair.

49. The GCF of 5 and 15 is _____

50. The GCF of 7 and 35 is _____

51. The GCF of 11 and 22 is _____

Part 3- Positive and Negatives, Rational Numbers

3.1 Adding & Subtracting Integers

Find the sum or difference.

52. $-2 + 3 =$

53. $-9 + (-1) =$

54. $5 + (-6) =$

55. $-8 + 4 =$

56. $-2 + 2 + (-1) =$

57. $-8 - 3 + 5 =$

58. $-2 + (-5) - 10 =$

3.2 Multiplying & Dividing Integers

Fill in the missing integer for each multiplication or division problem.

59. $\_\_\_\_ \times (-6) = 36$

60. $9 \times \_\_\_\_ = -45$

61. $\_\_\_\_ \times (-2) = 64$

62. $-10 \div \_\_\_\_\_ = -1$

63. $-255 \div \_\_\_\_ = 51$

64. ____$\div\ (-14) = -98$

3.3 Ordering and Comparing Integers

Order the Integers from LEAST to GREATEST.

65. $99,\ -14,\ 7,\ -7,\ 0,\ 1$ _____

66. $-1.5,\ -1.9,\ -2,\ -2.8,\ -1.05,\ -2.011$ _____

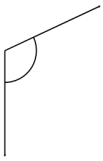
67. $-\frac{1}{2},\ -1.1,\ \frac{2}{3},\ -\frac{1}{4},\ \frac{1}{3}$ _____

Part 4- Geometry

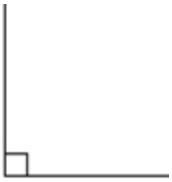
4.1 Identifying Angles

Classify the angles as ACUTE, OBTUSE, or RIGHT.

68.  _____

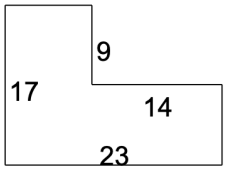
69.  _____

70.  _____

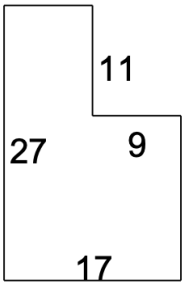
71.  _____

4.2 Perimeters

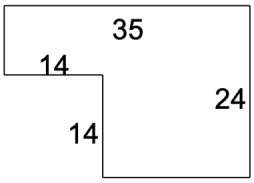
Find the perimeter. Pay attention as not all sides are given measurements.

72. 

_____

73. 

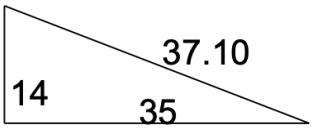
_____

74. 

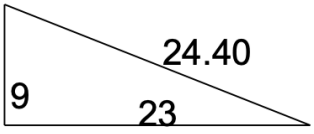
_____

4.3 Areas of Right Triangles

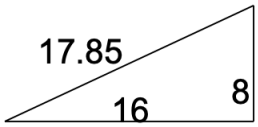
Find the area of the RIGHT triangles.

75. 

_____

76. 

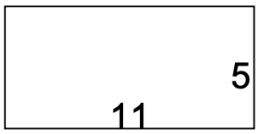
_____

77. 

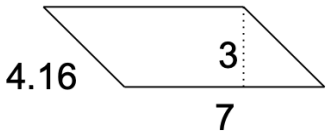
_____

4.4. Areas of Quadrilaterals

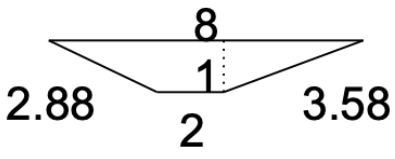
Find the area of the quadrilaterals.

78. 

_____

79. 

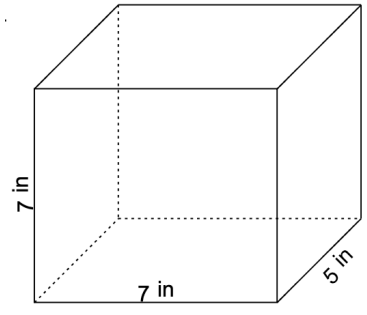
_____

80. 

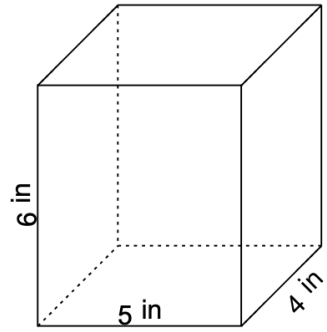
_____

4.5 Volumes of 3D Shapes

Find the volume of the rectangular prisms. Include units with your answers.

81. 

_____

82. 

_____

Part 5 - Exponents

5.1 Exponential Expressions

Rewrite the expressions as exponents.

83. $5 \times 5 \times 5 \times 5$ _____

84. $0.02 \times 0.02 \times 0.02$ _____

85. $\frac{2}{7} \times \frac{2}{7} \times \frac{2}{7} \times \frac{2}{7} \times \frac{2}{7} \times \frac{2}{7} \times \frac{2}{7}$ _____

Fill in the correct base, exponent or answer for each problem.

86. _____ $^{5} = 32$

87. $9 -$ = 729

88. $8^{2} =$_____

5.2. Solving Exponents

Solve each exponential equation.

89. $(-4)^{2} + (-2)^{3} =$_____

90. $(-3)^{4} - 0^{5} =$_____

91. $2^{3} - 8^{2} =$_____

92. $2^2 \times (-3)^3 =$_____

Part 6 - Distributive Property and Order of Operations

6.1 Distributive Property

Use the distributive property to simplify the expressions.

93. $3(2 + 6y)$ _____

94. $4(-5 + 0.5x)$ _____

95. $(-1)(8 - w)$_____

6.2 Order of Operations

Use the order of operations to simplify each expression.

96. $3 + (2^2 - (-5)) =$_____

97. $2x - 9^2 + 3x =$_____

98. $(-4)^3 - (1^0 + 10) =$_____

99. $7^2 \div (4 + 3) =$_____

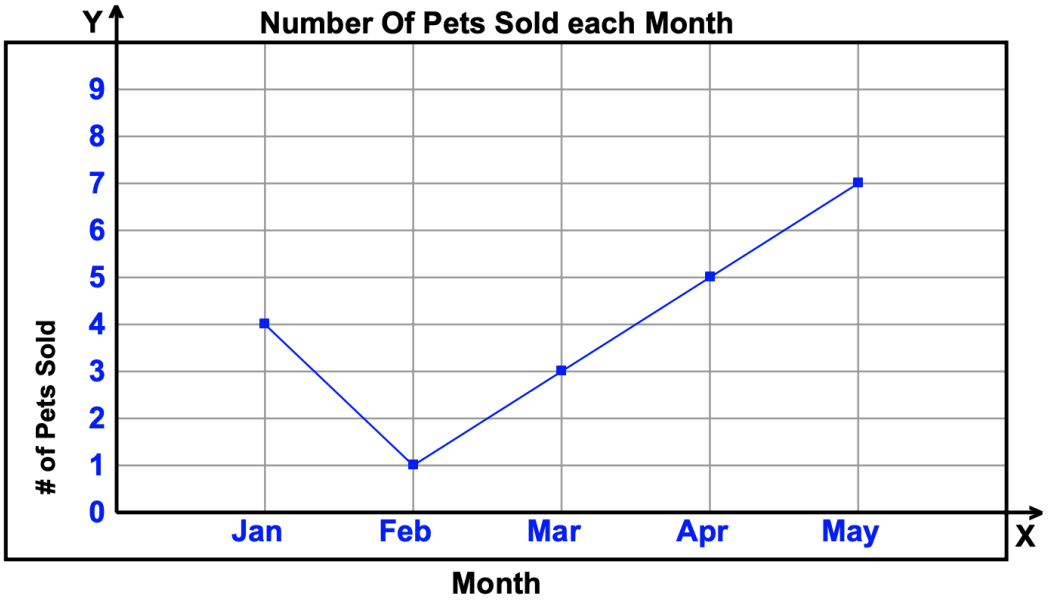
100. $6^2 - 10 \div 5 =$_____

101. $-5 \times 11 + (-6) =$_____

Part 7 - Coordinate Planes & Graphs

7.1 Reading and Interpreting Graphs

Answer questions a-c based on the graph given.



102.

a. How many pets were sold in January?

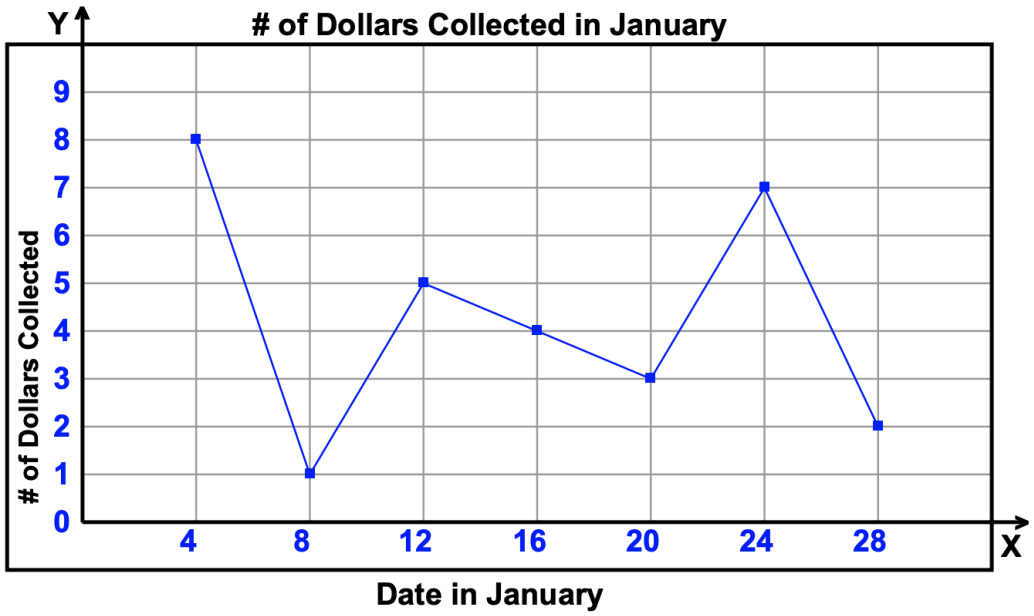
_____

b. How many more pets were sold in May than February?

_____

c. During which month were 3 pets sold?

_____



103.

a. On what date was the least amount of money collected?

_____

b. On which date was the most amount of money collected?

_____

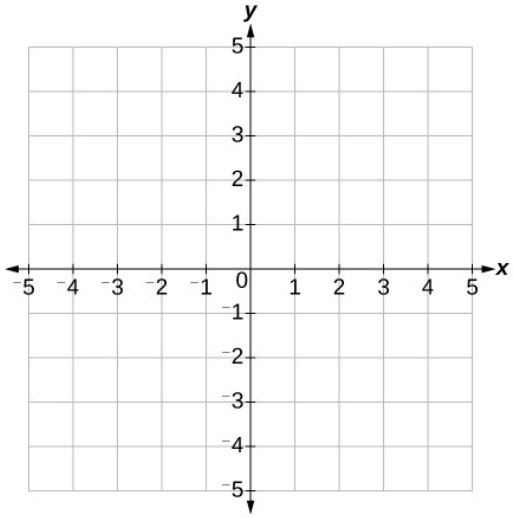
c. One which date was 4 dollars collected?

_____

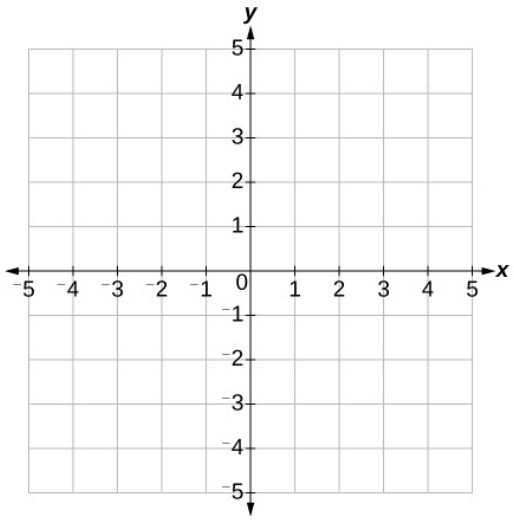
7.2 The Coordinate Plane

Plot the given point on the coordinate plane.

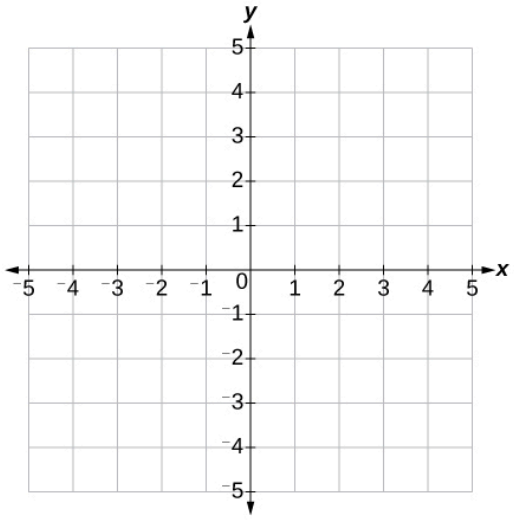
104. (4,5)



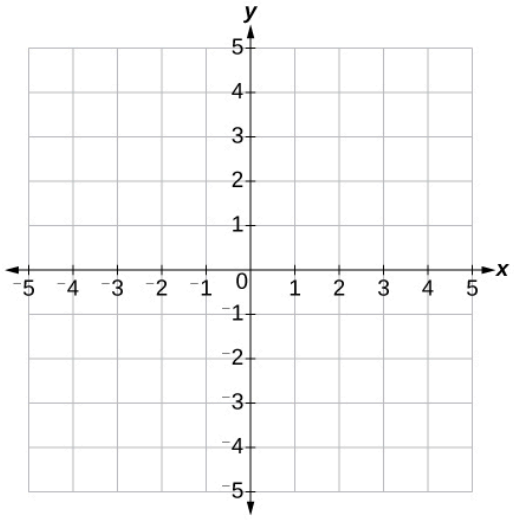
105. (-1,-1)



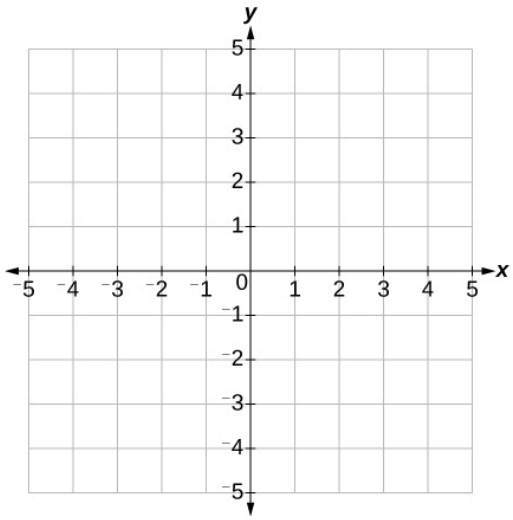
106. (-4, 2)



107. (0, 3)



108. (2,-4)



Part 8 - Data from Tables.

Use the data tables to answer parts a-c.

109.

Months	Average Temperature
March	37^0F
April	54^0F
May	60^0F`
June	81^0F
July	92^0F
August	92^0F

a. Describe the general trend of the data from March to August.

_____

b. Between which two months did the temperature increase the most?

_____

c. Between which two months did the temperature remain constant?

_____

110.

Amount of money earned	$150.00	$60.00	$90.00	$210
Hours worked	5	2	3	7

a. What is the relationship between amount of money earned and number of hours worked?

_____

b. How much money is earned per hour of work?

_____

c. If a person worked 10 hours, how much money would they earn?

_____

Part 9 - Mean, median, mode, and range.

Find the mean, median, mode and range for each set of numbers. Round to the nearest tenth if necessary. *You may use a calculator.*

111. 6, 5, 9, 10, 6, 11, 14, 4
   a. Mean: _____
   b. Median:_____
   c. Mode:_____
   d. Range:_____

112. 1.1, 1.1, 2.2, 2.3, 5.5, 6.2, 6.2, 6.2, 8.0
   a. Mean: _____
   b. Median:_____
   c. Mode:_____
   d. Range:_____

113. 8, 10, 6, 15, 21, 10, 8.5, 9, 10, 18, 19.5
   a. Mean: _____
   b. Median:_____
   c. Mode:_____
   d. Range:_____

ANSWER KEY

Part 1 – Ratios and Proportional Relationships

1.1 Writing, Reducing, and Comparing Ratios

1. *Draw*. Represent circles and squares with a ratio of 5:7.

2. *Solve*. Divide $1,200 into a 2:3 ratio.

$400 : $800

3. Use the table to create a ratio of Spotify to Apple Music users.

Music Service	6th Graders	7th Graders
Spotify	45	60
Apple Music	50	71

_____105_____ **Spotify Users :** _____121____ **Apple Music users**

4. Reduce the ratios.
   a. 4:12 _1__:_3___
   b. 42:22 _21__:_11___

5. Use >, < or = to compare the ratios
   a. 1:3 __=___6:18
   b. 2:10 __>__2:12
   c. 4:16 __>__4:20

1.2 Finding Unit Rates

Example: Unit rates make comparisons to a single unit. 4 burgers for $16.00 is equal to $4.00 per burger. This is done by dividing the total cost by the parts that contribute to it.

6. Find the unit rate for each problem.
    a. 25 books are distributed into 5 shopping bags. ____5____ books per bag.
    b. It takes 10 hours to drive 500 miles. ____50___ miles per hour.

7. During a blizzard, it snows 6 inches every hour. How much does it snow per minute?

    _1/10 or 0.1___ inches per minute.

8. George is buying potato chips at a grocery store. He can either spend $7.93 on a 15.25 ounce bag or $11.75 on a 25 ounce bag. Which is a better buy? Show your reasoning.

    Option 1: $0.52/ox ; Option 2: $0.47/oz. Option 2 is a better buy.

9. Use a table to solve the problems below.

    a. If it costs $4.00 to buy two hotdogs, how much will it cost to buy 10 hotdogs?

Number of hotdogs	**2**	**4**	**6**	**8**	**10**
Cost	$4	$8	$12	$16	$20

    It will cost $20 to buy 10 hotdogs.

    b. A student is reading a 48 page book. If they read at a rate of 8 pages every 15 minutes, how long will it take them to finish the book?

Pages read	**8**	16	24	32	40	48
Time past	**15**	30	45	60	1.15	1.30

    It will take the student 1 hour 30 minutes (90 minutes) to read 48 pages.

1.3 Proportions

10. *Solve the proportion.* 24 loaves of bread cost $48. How much does 10 loaves cost? Show your work.

$48/24 loaves = $2 per loaf.
$2 x 10 loaves = $20. **10 loaves of bread costs $20.**

11. Determine whether the given pairs are equivalent proportions.
    a. $\frac{7}{15}$ *and* $\frac{14}{45}$ _____no_____
    b. $\frac{5}{6}$ *and* $\frac{20}{24}$ _____yes_____
    c. $\frac{8}{3}$ *and* $\frac{32}{12}$ _____yes____

1.4 Percentages

12. Write 123 as a percent.
    123/100 = **1.23%**

13. What is 60% of 1,000?
    0.6 x 1,000 = **600**

14. What percent of 96 is 30?
    96/30 = 0.3215 ~ **32.2%**

15. 23% of people at a concert buy a soda. Write this percent as a fraction.
    23/100

16. There are 80 seventh graders are members of the music program. 20% are in the orchestra and 45% are in the concert band. The remaining students are in choir. How many students are in choir?
    0.2x80 = 16
    0.45x80=36

    36 + 16 = 52

    80-52= **28 students are in choir.**

17. What is 8.34 as a percent?
    0.0834%

18. What is 20% of 10?
    2

19. Write $\frac{1}{3}$ as a percent. Round to the nearest tenth if necessary.
    ⅓ = 0.333… ~ **33.3%**

20. Write $\frac{5}{9}$ as a percent. Round to the nearest tenth if necessary.
    5/9 = 0.555… ~ **55.6%**

Part 2 - Operations with Fractions & Decimals

2.1 Dividing Fractions

Find the quotient. Simplify/reduce answers when possible.

21. $8 \div \frac{1}{8} =$ 64

22. $7 \div \frac{2}{4} =$ 14

23. $9 \div \frac{2}{10} =$ 45

24. $1 \div \frac{5}{10} =$ 2

25. $\frac{8}{10} \div \frac{1}{3} =$ 12/5 = **2 2/5**

26. $\frac{1}{7} \div \frac{2}{10} =$ 10/14 = **5/7**

27. $\frac{5}{6} \div \frac{2}{3} =$ 15/12 = 5/4 = **1 1/4**

28. $5\frac{3}{5} \div \frac{1}{5} =$ 3

29. $15\frac{2}{3} \div \frac{1}{3} =$ 2

30. $10\frac{1}{3} \div \frac{1}{3} =$ 1

31. $9\frac{11}{12} \div \frac{3}{12} =$11/3 = **3 2/3**

2.2 Adding & Subtracting with Decimals

32.

$$\begin{array}{r} 0.007 \\ +\ 0.028 \\ \hline 0.035 \end{array}$$

33.

$$\begin{array}{r} 44.5300 \\ +\ \ 0.0005 \\ \hline 44.5305 \end{array}$$

34.

$$\begin{array}{r} 0.0626 \\ +\ 0.6000 \\ \hline 0.6626 \end{array}$$

35.

$$\begin{array}{r} 83.1200 \\ +\ \ 0.0066 \\ \hline 83.1266 \end{array}$$

36.

$$\begin{array}{r} 0.007 \\ +\ 0.028 \\ \hline 0.035 \end{array}$$

37.

$$\begin{array}{r} 90.0000 \\ -\ \ 0.0260 \\ \hline 89.9740 \end{array}$$

38.

$$\begin{array}{r} 0.100 \\ -\ 0.019 \\ \hline 0.081 \end{array}$$

39.

$$\begin{array}{r} 0.00300 \\ -\ 0.00035 \\ \hline 0.00265 \end{array}$$

40.

$$\begin{array}{r} 80.0 \\ -\ \ 8.7 \\ \hline 71.3 \end{array}$$

41.

$$\begin{array}{r} 0.800 \\ -\ 0.059 \\ \hline 0.741 \end{array}$$

2.3 Multiplying with Decimals.

Find the product.

42.

$$\begin{array}{r} 3.000 \\ \times\ 0.008 \\ \hline 0.024 \end{array}$$

43.

$$\begin{array}{r} 10.00 \\ \times\ 0.08 \\ \hline 0.80 \end{array}$$

44.

$$\begin{array}{r} 0.3 \\ \times\ 0.3 \\ \hline 0.081 \end{array}$$

45.

$$\begin{array}{r} 0.07 \\ \times\ 0.20 \\ \hline 0.09 \end{array}$$

2.4 LCM and GCF.

Find the least common multiple (LCM) of each pair.

46. The LCM of 3 and 4 is ___12___

47. The LCM of 12 and 18 is __36_____

48. The LCM of 8 and 5 is ___40____

Find the greatest common factor (GCF) of each pair.

49. The GCF of 5 and 15 is __5_____

50. The GCF of 7 and 35 is __7____

51. The GCF of 11 and 22 is ___11___

Part 3- Positive and Negatives, Rational Numbers

3.1 Adding & Subtracting Integers

Find the sum or difference.

52. $-2+3=$ 1

53. $-9+(-1)=$ -10

54. $5+(-6)=$ -1

55. $-8+4=$ -4

56. $-2+2+(-1)=$ -1

57. $-8-3+5=$ -6

58. $-2+(-5)-10=$ -17

3.2 Multiplying & Dividing Integers

Fill in the missing integer for each multiplication or division problem.

59. _-6_ $\times (-6)=36$

60. $9\times$ _-5__ $=-45$

61. _-32_ $\times (-2)=64$

62. $-10\div$ _10__ $=-1$

63. $-255 \div$ -5 $= 51$

64. 7 $\div (-14) = -98$

3.3 Ordering and Comparing Integers

Order the Integers from LEAST to GREATEST.

65. $99, -14, 7, -7, 0, 1$ -14, -7, 0, 1, 7, 99

66. $-1.5, -1.9, -2, -2.8, -1.05, -2.011$ -2.8, -2.011, -2, -1.9, -1.5, -1.05

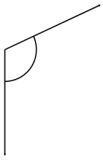
67. $-\frac{1}{2}, -1.1, \frac{2}{3}, -\frac{1}{4}, \frac{1}{3}$ -1.1, -½, -¼, ⅓, ⅔

Part 4- Geometry

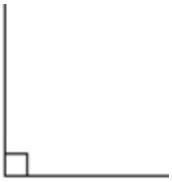
4.1 Identifying Angles

Classify the angles as ACUTE, OBTUSE, or RIGHT.

68.  acute

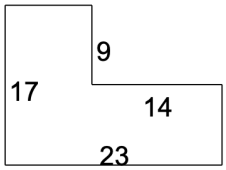
69.  obtuse

70.  obtuse

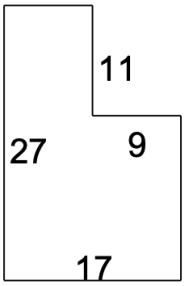
71.  right

4.2 Perimeters

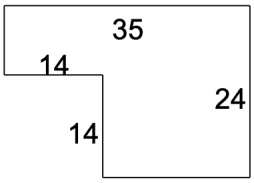
Find the perimeter. Pay attention as not all sides are given measurements.

72. 

top side: 9, right side:8, 9+8+9+14+17+23= **80**

73. 

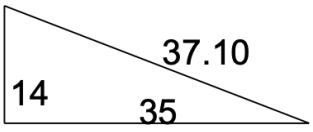
16+8+11+27+9+17= **88**

74. 

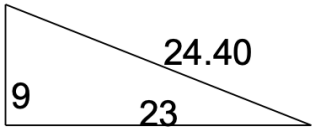
21+10+35+14+14+24= **118**

4.3 Areas of Right Triangles

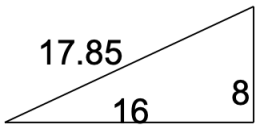
Find the area of the RIGHT triangles.

75. 

245

76. 

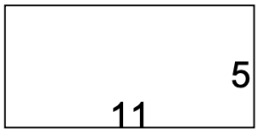
103.5

77. 

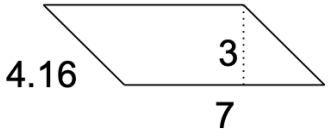
64

4.4. Areas of Quadrilaterals

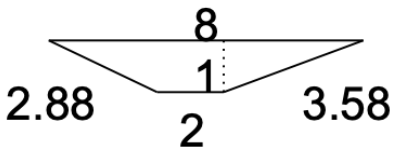
Find the area of the quadrilaterals.

78. 

50

79. 

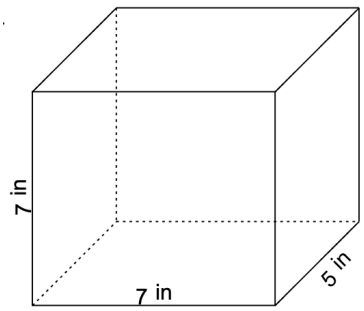
21

80. 

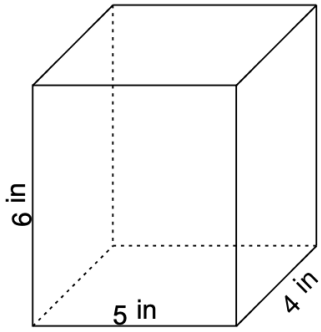
5

4.5 Volumes of 3D Shapes

Find the volume of the rectangular prisms. Include units with your answers.

81. 

245 in^3

82. 

120 in^3

Part 5 - Exponents

5.1 Exponential Expressions

Rewrite the expressions as exponents.

83. $5 \times 5 \times 5 \times 5$ 5^4

84. $0.02 \times 0.02 \times 0.02$ 0.2^4

85. $\frac{2}{7} \times \frac{2}{7} \times \frac{2}{7} \times \frac{2}{7} \times \frac{2}{7} \times \frac{2}{7} \times \frac{2}{7}$ $2/7^{\ 7}$

Fill in the correct base, exponent or answer for each problem.

86. $\_\_2\_\_^{\ 5} = 32$

87. $9^{3} = 729$

88. $8^2 =$ 64

5.2. Solving Exponents

Solve each exponential equation.

89. $(-4)^2 + (-2)^3 =$ 8

90. $(-3)^4 - 0^5 =$ 81

91. $2^3 - 8^2 =$ -56

92. $2^2 \times (-3)^3 =$ -23

Part 6 - Distributive Property and Order of Operations

6.1 Distributive Property

Use the distributive property to simplify the expressions.

93. $3(2 + 6y)$ 6+18y

94. $4(-5 + 0.5x)$ -20 + 2x

95. $(-1)(8 - w)$ -8 + w

6.2 Order of Operations

Use the order of operations to simplify each expression.

96. $3 + (2^2 - (-5)) =$ 12

97. $2x - 9^2 + 3x =$ 5x - 81

98. $(-4)^3 - (1^0 + 10) =$ -75

99. $7^2 \div (4 + 3) =$ 2

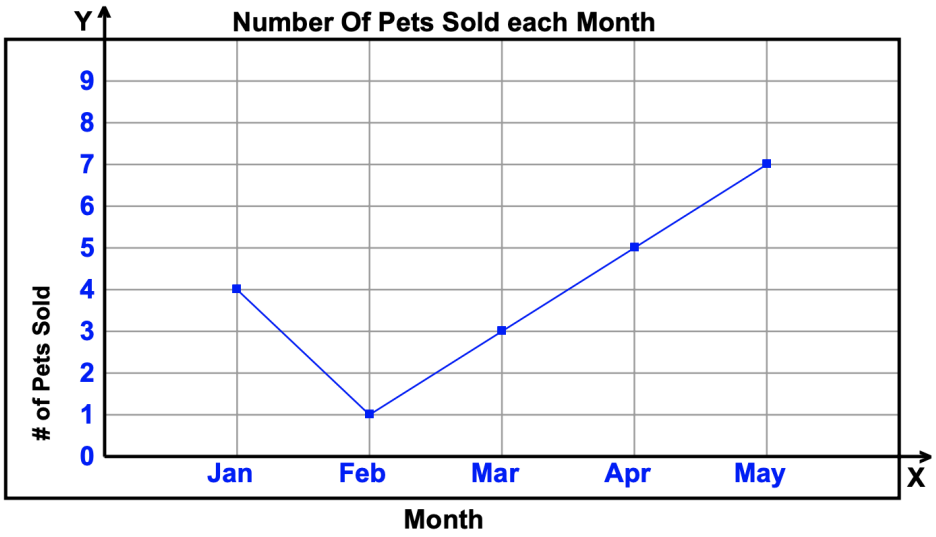
100. $6^2 - 10 \div 5 =$ 34

101. $-5 \times 11 + (-6) =$ -61

Part 7 - Coordinate Planes & Graphs

7.1 Reading and Interpreting Graphs

Answer questions a-c based on the graph given.

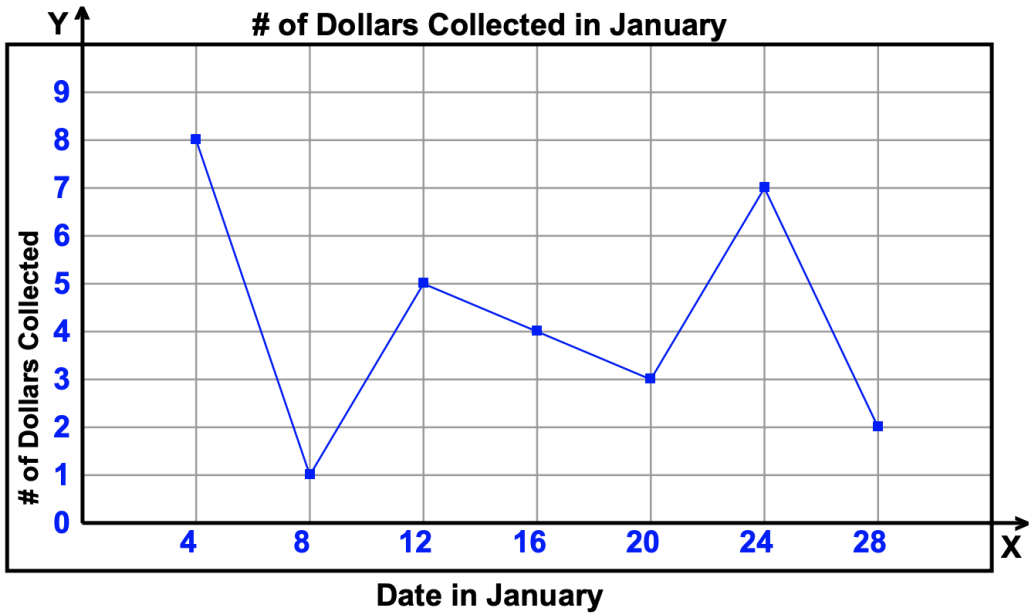


102.

a. How many pets were sold in January?
4

b. How many more pets were sold in May than February?
6

c. During which month were 3 pets sold?
March



103.

a. On what date was the least amount of money collected?

_____8th_____

b. On which date was the most amount of money collected?

_____4th_____

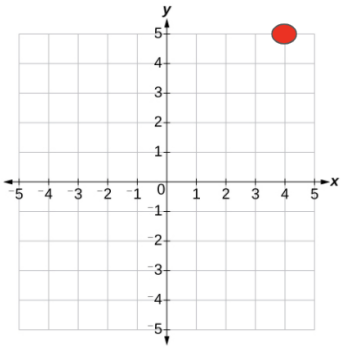
c. One which date was 4 dollars collected?

_____16th_____

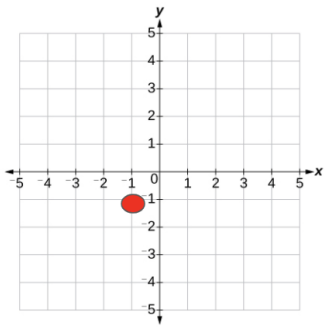
7.2 The Coordinate Plane

Plot the given point on the coordinate plane.

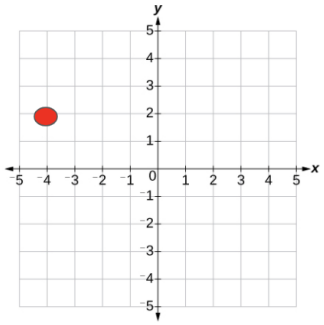
104. (4,5)



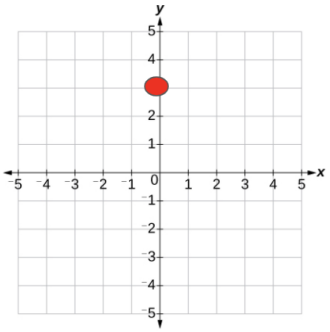
105. (-1,-1)



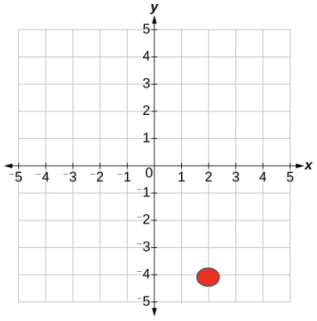
106. (-4, 2)



107. (0, 3)



108. (2,-4)



Part 8 - Data from Tables.

Use the data tables to answer parts a-c.

109.

Months	Average Temperature
March	37^0F
April	54^0F
May	60^0F`
June	81^0F
July	92^0F
August	92^0F

a. Describe the general trend of the data from March to August.
The temperature increases over time

b. Between which two months did the temperature increase the most?
May to June by 21 degrees & March to April by 17 degrees

c. Between which two months did the temperature remain constant?
July to August

110.

Amount of money earned	$150.00	$60.00	$90.00	$210
Hours worked	5	2	3	7

a. What is the relationship between amount of money earned and number of hours worked?
The more hours worked, the more money earned

b. How much money is earned per hour of work?
$30/hr

c. If a person worked 10 hours, how much money would they earn?
$300

Part 9 - Mean, median, mode, and range.

Find the mean, median, mode and range for each set of numbers. Round to the nearest tenth if necessary.

111. 6, 5, 9, 10, 6, 11, 14, 4
   a. Mean: 8.1
   b. Median: 7.5
   c. Mode: 6
   d. Range: 10

112. 1.1, 1.1, 2.2, 2.3, 5.5, 6.2, 6.2, 6.2, 8.0
   a. Mean: 4.3
   b. Median: 5.5
   c. Mode: 6.2
   d. Range: 6.9

113. 8, 10, 6, 15, 21, 10, 8.5, 9, 10, 18, 19.5
   a. Mean: 12.3
   b. Median: 10
   c. Mode: 10
   d. Range: 15