Summer Math

The Summer Before 7th Grade

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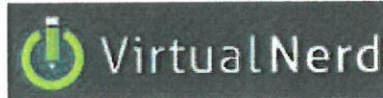
SEACREST
COUNTRY DAY SCHOOL

Summer Math Sections:	Notes:
Summer Math The Summer Before 7th Grade Practice Packet	**Focuses On:** - adding, subtracting, multiplying, and dividing fractions and mixed numbers - adding, subtracting, multiplying, and dividing decimals - area and perimeter of 2D figures, and volume of rectangular prisms (a few geometry-related word problems are included, as well) - one-step equations (addition, subtraction, multiplication, and division equations) - all four operations with decimals, including order of operations with decimals - all four operations with fractions & mixed numbers - ratios, rates, & unit rates - converting fractions, decimals, and percent - finding the percent of a number - comparing integers & absolute value - graphing in the coordinate plane (all 4 quadrants) - perimeter and area of 2D figures (rectangles, parallelograms, triangles, & trapezoids) & volume of rectangular prisms - evaluating algebraic expressions - solving one-step equations - problem solving **Includes explanations & examples and practice problems for the summer.** Recommended Use: • Practice 25 problems a week for 8 weeks • Show all your work and calculations • Provided answer key to check your work.
Virtual Nerd Video Tutorial Browser See Provided Letter	Recommended Use: • View supporting math video tutorials before, during, or after your practice session with your summer math packet. • Actively view the videos while recording and solving examples.

Middle School Summer Math
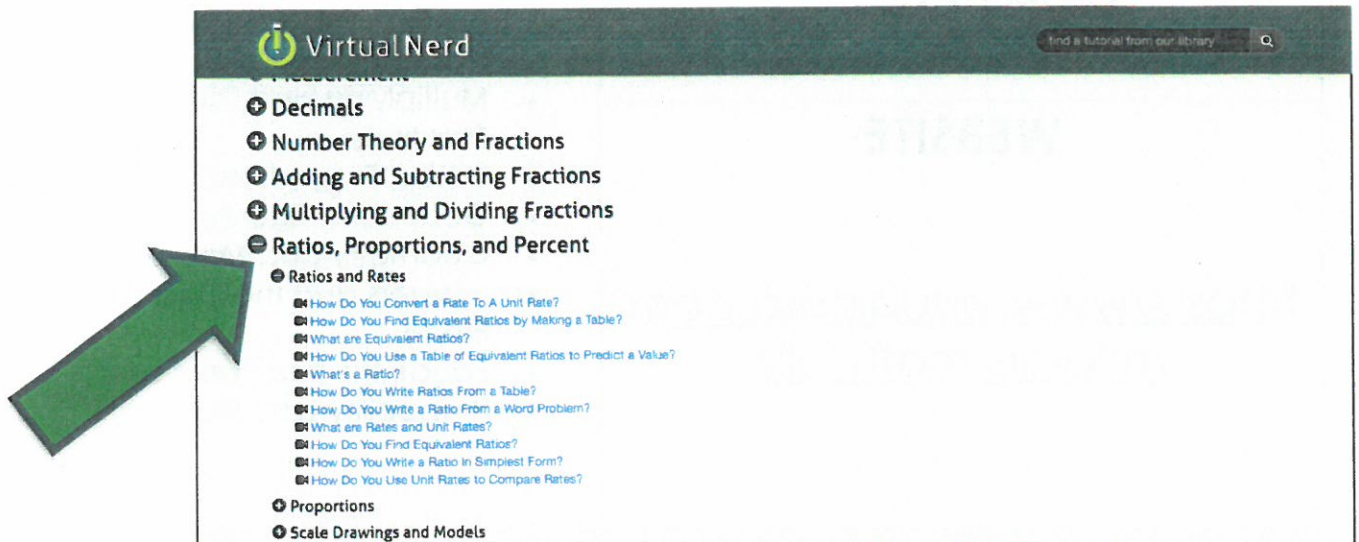# The Summer Before 7ᵗʰ Grade

⏻ VirtualNerd

Virtual Nerd is an expansive library of instructional math content. Please use it this summer as a supplemental learning resource. It is a helpful resource that helps bring practice, clarity and skill reinforcement to your at home math routine.
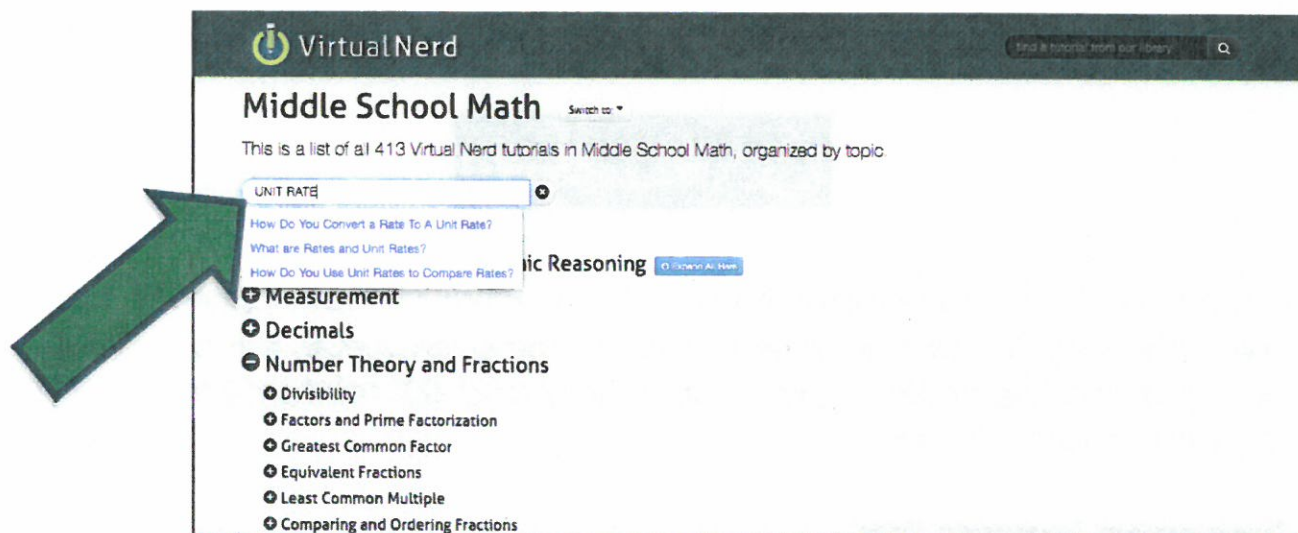
Suggested Summer Use:

- Practice content in your summer math packet.

- Use a mobile device to SCAN your grade level's QR code(s) to access the Virtual Nerd website. If you're using a desktop or laptop computer use the provided website.

- Search for a video related to the math content practiced in your packet that day. For example: if you're working on finding the *UNIT RATE* in your math packet, either before, during or after your practice session, search **UNIT RATE** by expanding the topic lists (Click on the **+** sign until you find your topic and specific tutorial) **OR** type directly into the search bar by keyword or topic.

EXPANDING TOPICS OPTION

⏻ VirtualNerd   find a tutorial from our library   🔍

- Measurement
- ⊕ **Decimals**
- ⊕ **Number Theory and Fractions**
- ⊕ **Adding and Subtracting Fractions**
- ⊕ **Multiplying and Dividing Fractions**
- ⊖ **Ratios, Proportions, and Percent**
  - ⊖ Ratios and Rates
    - 📹 How Do You Convert a Rate To A Unit Rate?
    - 📹 How Do You Find Equivalent Ratios by Making a Table?
    - 📹 What are Equivalent Ratios?
    - 📹 How Do You Use a Table of Equivalent Ratios to Predict a Value?
    - 📹 What's a Ratio?
    - 📹 How Do You Write Ratios From a Table?
    - 📹 How Do You Write a Ratio From a Word Problem?
    - 📹 What are Rates and Unit Rates?
    - 📹 How Do You Find Equivalent Ratios?
    - 📹 How Do You Write a Ratio In Simplest Form?
    - 📹 How Do You Use Unit Rates to Compare Rates?
  - ⊕ Proportions
  - ⊕ Scale Drawings and Models

SEARCH BAR OPTION

View the video with a **notebook** and **pencil.** Walk through the examples in the video with the instructional coach. Play the video, pause to copy the problem, work through to solve it with the coach.

Virtual Nerd Access	
QR CODE **WEBSITE** https://www.virtualnerd.com/middle-math/all/	**MATH TOPICS** *Featuring 400+ Video Tutorials* • Number Sense and Algebraic Reasoning • Measurement • Decimals • Number Theory and Fractions • Adding and Subtracting Fractions • Multiplying and Dividing Fractions • Ratios, Proportions, and Percent • Geometric Figures • Geometry and Measurement • Integers and the Coordinate Plane • Equations and Functions • Probability and Statistics

Addition & Subtraction of Fractions & Mixed Numbers

Adding & Subtracting Fractions

1. Find a common denominator.

2. Add or subtract the two numerators and keep the denominator the same.

3. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $\dfrac{1}{3} + \dfrac{1}{6}$

$$\dfrac{1}{3} \overset{\times 2}{\underset{\times 2}{=}} \dfrac{2}{6}$$
$$+ \quad \dfrac{1}{6} \overset{\times 1}{\underset{\times 1}{=}} \dfrac{1}{6}$$
$$\dfrac{3}{6} \overset{\div 3}{\underset{\div 3}{=}} \boxed{\dfrac{1}{2}}$$

Adding Mixed Numbers

1. Find a common denominator.

2. Add the two numerators and keep the denominator the same.

3. Add the whole numbers.

4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $2\dfrac{3}{4} + 1\dfrac{2}{3}$

$$2\dfrac{3}{4} = 2\dfrac{9}{12}$$
$$+ \quad 1\dfrac{2}{3} = 1\dfrac{8}{12}$$
$$3\dfrac{17}{12} = \boxed{4\dfrac{5}{12}}$$

Subtracting Mixed Numbers

1. Find a common denominator.

2. Subtract the two numerators and keep the denominators the same. If the top numerator is smaller than the bottom numerator, borrow from the whole number and rename the top fraction.

3. Subtract the whole numbers

4. Simplify the answer.

ex: $3\dfrac{1}{4} - 1\dfrac{1}{3}$

$$3\dfrac{1}{4} = 3\overset{2}{\cancel{3}}\dfrac{3}{12} + \dfrac{12}{12} = 2\dfrac{15}{12}$$
$$- \quad 1\dfrac{1}{3} = 1\dfrac{4}{12} \qquad = 1\dfrac{4}{12}$$
$$\boxed{1\dfrac{11}{12}}$$

Find the sum. Write your answer in simplest form.

1. $\frac{1}{4} + \frac{1}{2}$	2. $\frac{2}{5} + \frac{1}{3}$	3. $\frac{7}{15} + \frac{3}{10}$	4. $\frac{11}{28} + \frac{4}{7}$
5. $\frac{3}{4} + \frac{1}{12}$	6. $\frac{9}{10} + \frac{13}{20}$	7. $4\frac{15}{16} + 7\frac{3}{4}$	8. $2\frac{16}{25} + 3\frac{18}{20}$
9. $3\frac{2}{5} + 9\frac{1}{10}$	10. $6\frac{1}{42} + 4\frac{5}{6}$	11. $18\frac{7}{9} + 16$	12. $4\frac{7}{8} + \frac{1}{3}$

Find the difference. Write your answer in simplest form.

13. $\frac{7}{8} - \frac{1}{4}$	14. $\frac{13}{15} - \frac{1}{3}$	15. $\frac{7}{9} - \frac{2}{6}$	16. $\frac{21}{24} - \frac{3}{8}$
17. $\frac{3}{14} - \frac{1}{7}$	18. $\frac{9}{10} - \frac{1}{2}$	19. $9 - 4\frac{1}{12}$	20. $12\frac{18}{25} - 8\frac{4}{5}$
21. $5\frac{8}{9} - 3\frac{2}{3}$	22. $8\frac{12}{16} - 7\frac{31}{32}$	23. $10\frac{3}{4} - 6\frac{4}{5}$	24. $13\frac{7}{8} - \frac{10}{12}$

Multiplication & Division of Fractions & Mixed Numbers

Multiplying Fractions & Mixed Numbers

1. Turn any mixed numbers and whole numbers into improper fractions.

2. Cross-simplify if possible.

3. Multiply the numerators and then multiply the denominators

4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $2\frac{1}{4} \cdot \frac{1}{3}$

$$\frac{\overset{3}{\cancel{9}}}{4} \cdot \frac{1}{\underset{1}{\cancel{3}}} = \boxed{\frac{3}{4}}$$

Dividing Fractions & Mixed Numbers

1. Turn any mixed numbers and whole numbers into improper fractions.

2. Keep the first fraction the same, change the division to multiplication, and flip the second fraction to its reciprocal.

3. Multiply the fractions.

4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $7 \div 1\frac{3}{4}$

$$\frac{7}{1} \div \frac{7}{4}$$

$$\downarrow$$

$$\frac{\overset{1}{\cancel{7}}}{1} \cdot \frac{4}{\underset{1}{\cancel{7}}} = \frac{4}{1} = \boxed{4}$$

Find the product. Write your answer in simplest form.

25. $\frac{1}{8} \cdot \frac{1}{7}$	26. $\frac{2}{9} \cdot \frac{12}{14}$	27. $\frac{7}{12} \cdot \frac{8}{14}$	28. $\frac{9}{24} \cdot \frac{16}{81}$
29. $\frac{3}{14} \cdot \frac{21}{33}$	30. $\frac{1}{2} \cdot \frac{9}{13}$	31. $2\frac{1}{6} \cdot \frac{3}{5}$	32. $8\frac{4}{5} \cdot 1\frac{5}{11}$
33. $2\frac{1}{2} \cdot \frac{2}{5}$	34. $9\frac{2}{3} \cdot 6$	35. $13\frac{1}{3} \cdot 2\frac{1}{10}$	36. $7 \cdot \frac{1}{3}$

Find the quotient. Write your answer in simplest form.

37. $\frac{5}{6} \div \frac{1}{4}$	38. $\frac{1}{2} \div \frac{1}{4}$	39. $\frac{3}{4} \div \frac{9}{12}$	40. $\frac{21}{35} \div \frac{7}{25}$
41. $\frac{6}{7} \div 3$	42. $\frac{2}{11} \div \frac{1}{33}$	43. $1\frac{1}{4} \div 2\frac{1}{3}$	44. $5\frac{3}{6} \div 3$
45. $10\frac{1}{4} \div \frac{2}{5}$	46. $3\frac{2}{3} \div 1\frac{1}{7}$	47. $4\frac{3}{8} \div \frac{9}{10}$	48. $8 \div \frac{3}{4}$

Operations with Decimals

Adding & Subtracting Decimals

1. Write the problem vertically, lining up the decimal points.

2. Add additional zeroes at the end, if necessary, to make the numbers have the same number of decimal places.

3. Add/subtract as if the numbers are whole numbers

4. Bring the decimal point straight down

ex: $10.03 + 5.2$

$$
\begin{array}{r}
10.03 \\
+\ 5.20 \\
\hline
\boxed{15.23}
\end{array}
$$

Multiplying Decimals

1. Write the problem vertically with the numbers lined up to the right. The decimal points do NOT need to be lined up.

2. Ignore the decimals and multiply as if the numbers are whole numbers.

3. Count the total number of decimal places in the factors and put a decimal point in the product so that it has that same number of decimal places.

ex: 1.03×2.8

$$
\begin{array}{r}
1.03 \longrightarrow \text{2 decimal places} \\
\times\ \ 2.8 \longrightarrow \text{1 decimal place} \\
\hline
\text{3 decimal places} \\
824 \\
+\ \ 2060 \\
\hline
2884 \longrightarrow \boxed{2.884}
\end{array}
$$

Dividing Decimals

1. Write the dividend under the long division symbol and the divisor to the left of it.

2. Move the decimal point in the divisor after the number to turn it into a whole number and then move the decimal in the dividend the same number of places. Then bring it up.

3. Divide as if the numbers are both whole numbers.

4. Annex zeros in the dividend as needed until there is no remainder. If your answer is a repeating decimal, write the answer using bar notation.

ex: $25.3 \div 0.3$

$$
\begin{array}{r}
\boxed{84.\overline{3}} \\
0.3\overline{)25.3\,0} \\
-24 \\
\hline
13 \\
-12 \\
\hline
10 \\
-\ 9 \\
\hline
1
\end{array}
$$

Find the sum or difference.

49. 6.2 + 3.4	50. 8.04 − 6.8	51. 12.4 + 0.899	52. 12.9 − 2.043
53. 163.29 + 13.987	54. 13 − 6.7	55. 3.91 + 1.93	56. 34.2 − 29.027

Find the product.

57. 9.2 · 3.1	58. (14.1)(2.7)	59. 91 × 4.5	60. 82.04 × 1.2
61. (1.1)(6.78)	62. 45 · 0.1	63. 0.010 × 13.9	64. (2.34)(5.6)

Find the quotient.

65. 8.4 ÷ 2	66. 1.56 ÷ 1.3	67. 7.45 ÷ 2	68. 9 ÷ 0.8
69. 68 ÷ 3.4	70. 9.4 ÷ 0.2	71. 0.045 ÷ 0.15	72. 4 ÷ 0.3

Geometry

Area Formulas

*** Remember that area is the space *inside* a figure! ***

- <u>Area of a Rectangle</u> = length x width

- <u>Area of a Parallelogram</u> = base x height

- <u>Area of a Triangle</u> = ½ base x height

- <u>Area of a Circle</u> = π x radius^2

Perimeter Formulas

*** Remember that perimeter is the distance *around* a figure! ***

- <u>Perimeter of Any Polygon</u>: add up all of the side lengths

- <u>Circumference of a Circle</u> = 2 x π x radius

Volume Formula

*** Remember that volume is the capacity of a 3D figure! ***

- <u>Volume of a Rectangular Prism</u>: length x width x height

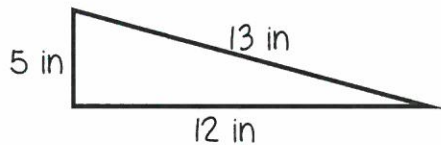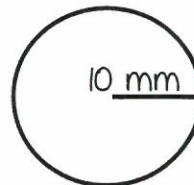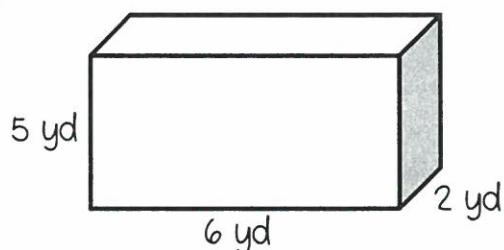Find the area and perimeter (or circumference) of each figure. Use 3.14 for π.
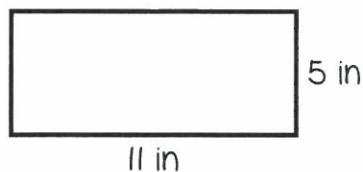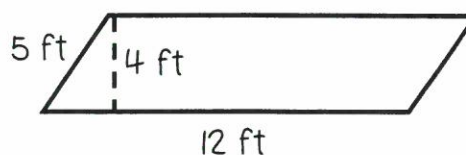
73.	74.
5 in / 11 in	5 ft / 4 ft / 12 ft

75.	76.
13 in / 5 in / 12 in	10 mm

Find the volume.

77.

5 yd

6 yd

2 yd

olve each word problem.

78. Danny is installing a fence around his rectangular yard. His yard is 20 feet long by 45 feet wide. If the fencing he picked out costs $25 per foot, how much money will Danny spend on the fence?

79. Tameka wants to put a carpet in her rectangular bedroom. Her room is 22 feet long by 18 feet wide. How much carpeting will Tameka need?

80. Don wants to bring some sand home from his vacation at the beach. He has a box that is 3 inches wide, 4 inches long, and 2 inches tall. How much sand can he fit in the box?

One-Step Equations

Addition Equations

Subtract the number being added to the variable from both sides of the equation

$$ex: \begin{array}{r} 4 + x = 18 \\ -4 \qquad -4 \\ \hline \boxed{x = 14} \end{array}$$

Subtraction Equations

Add the number being subtracted from the variable to both sides of the equation

$$ex: \begin{array}{r} 20 = a - 5 \\ +5 \qquad +5 \\ \hline 25 = a \rightarrow \boxed{a = 25} \end{array}$$

Multiplication Equations

Divide both sides of the equation by the number next to the variable

$$ex: \frac{7b}{7} = \frac{28}{7}$$
$$\boxed{b = 4}$$

Division Equations

Multiply both sides of the equation by the number under the variable

$$ex: 5 \cdot \frac{n}{5} = 10 \cdot 5$$
$$\boxed{n = 50}$$

Solve each one-step equation for the given variable.

81. $x + 18 = 32$	82. $18f = 720$	83. $h - 56 = 57$	84. $\dfrac{b}{6} = 12$
85. $12 = r - 76$	86. $33 + d = 65$	87. $14m = 42$	88. $10c = 5$
89. $38 = 19j$	90. $w + 65 = 100$	91. $r - 7 = 9$	92. $x \div 12 = 9$
93. $14 + x = 18$	94. $\dfrac{p}{22} = 7$	95. $47 = x - 5$	96. $k + 16 = 76$
97. $2 = 6m$	98. $t - 8 = 14$	99. $\dfrac{h}{19} = 11$	100. $47 = 18 + b$

Adding & Subtracting Decimals

1. Write the problem vertically, lining up the decimal points.

   Add additional zeroes at the end, if necessary, to make the numbers have the same number of decimal places.

3. Add/subtract as if the numbers are whole numbers

4. Bring the decimal point straight down

ex: 14.2 - 7.934

$$
\begin{array}{r}
14.200 \\
- \ \ 7.934 \\
\hline
6.266 \\
\end{array}
$$

Multiplying Decimals

1. Write the problem vertically with the numbers lined up to the right. The decimal points do NOT need to be lined up.

2. Ignore the decimals and multiply as if the numbers are whole numbers.

3. Count the total number of decimal places in the factors and put a decimal point in the product so that it has that same number of decimal places.

ex: 6.94 x 7.8

$$
\begin{array}{r}
6.94 \rightarrow \text{2 decimal places} \\
\times \quad 7.8 \rightarrow \text{1 decimal place} \\
\hline
\end{array}
$$

3 decimal places

$$
\begin{array}{r}
5552 \\
+ \ 48580 \\
\hline
54132
\end{array}
$$

$$54.132$$

Dividing Decimals

1. Write the dividend under the long division symbol and the divisor to the left of it.

2. Move the decimal point in the divisor after the number to turn it into a whole number and then move the decimal in the dividend the same number of places. Then bring it up.

3. Divide as if the numbers are both whole numbers.

4. Annex zeros in the dividend as needed until there is no remainder. If your answer is a repeating decimal, write the answer using bar notation.

ex: 25.3 ÷ 0.3

$$
\begin{array}{r}
84.\overline{3} \\
0.3\overline{)25.3\,0} \\
-24 \\
\hline
13 \\
-12 \\
\hline
10 \\
-9 \\
\hline
1
\end{array}
$$

Order of Operations

1. Grouping Symbols (parentheses, brackets, etc.)

2. Exponents

3. Multiplication & Division (left to right)

4. Addition & Subtraction (left to right)

ex: 5 + 4(3 - 1.2)

5 + 4(1.8)

5 + 7.2

12.2

Evaluate each expression.

1. 5.983 + 2.99	2. 224 - 56.73	3. 6.12 - 4.923
4. 24.5 · 3.2	5. 0.23 · 7	6. 3.86 · 9.15
7. 14.8 ÷ 5	8. 46.3 ÷ 1.5	9. 147 ÷ 2.25
10. 24.33 - 2.5 · 7	11. $3.9 + 4.5^2$	12. 9.25(18.4 - 2 · 1.2)

Solve each word problem, showing all work.

13. Jeff had $46.18 in his wallet Monday morning. He gave half of his money to his brother. He then bought two donuts for $0.75 each and a cup of coffee for $2.99. How much money did Jeff have left?	14. Five friends split a $65.20 bill at a restaurant. They also each left $2.75 for the tip. How much money did each person pay in all?

Adding Fractions & Mixed Numbers

1. Find a common denominator for the two fractions.

2. Add the two numerators and keep the denominator the same.

3. Add the whole numbers.

4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $3\frac{3}{4} + 2\frac{1}{2}$

$$3\frac{3}{4} = 3\frac{3}{4}$$
$$+\ 2\frac{1}{2} = 2\frac{2}{4}$$
$$\rule{3cm}{0.4pt}$$
$$5\frac{5}{4} = \boxed{6\frac{1}{4}}$$

Subtracting Fractions & Mixed Numbers

1. Find a common denominator for the two fractions.

2. Subtract the two numerators and keep the denominators the same. If the top numerator is smaller than the bottom numerator, borrow from the whole number and rename the top fraction.

3. Subtract the whole numbers.

4. Simplify the answer.

ex: $5\frac{1}{4} - 1\frac{2}{3}$

$$5\frac{1}{4} = 5\frac{3}{12} = 4\frac{15}{12}$$
$$-\ 1\frac{2}{3} = 1\frac{8}{12} = 1\frac{8}{12}$$
$$\rule{3cm}{0.4pt}$$
$$\boxed{3\frac{7}{12}}$$

Multiplying Fractions & Mixed Numbers

1. Turn any mixed numbers and whole numbers into improper fractions.

2. Cross-simplify if possible.

3. Multiply the numerators and then multiply the denominators

4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $2\frac{1}{6} \cdot \frac{4}{7}$

$$\frac{13}{\cancel{3}6} \cdot \frac{\cancel{4}^{2}}{7} = \frac{26}{21} = \boxed{1\frac{5}{21}}$$

Dividing Fractions & Mixed Numbers

1. Turn any mixed numbers and whole numbers into improper fractions.

2. Keep the first fraction the same, change the division to multiplication, and flip the second fraction to its reciprocal.

3. Multiply the fractions.

4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $7 \div 1\frac{3}{4}$

$$\frac{7}{1} \div \frac{7}{4}$$
$$\downarrow$$
$$\frac{\cancel{7}^{1}}{1} \cdot \frac{4}{\cancel{7}_{1}} = \frac{4}{1} = \boxed{4}$$

Evaluate each expression.

15. $\frac{4}{5} + \frac{3}{4}$	16. $4\frac{2}{7} + 2\frac{9}{14}$	17. $8\frac{11}{12} + 9\frac{5}{18}$
18. $6 - \frac{3}{8}$	19. $8\frac{3}{5} - 2\frac{1}{3}$	20. $4\frac{1}{6} - \frac{8}{9}$
21. $\frac{4}{25} \cdot \frac{15}{16}$	22. $2\frac{3}{4} \cdot 8$	23. $6\frac{5}{8} \cdot 3\frac{1}{2}$
24. $\frac{7}{9} \div \frac{2}{3}$	25. $\frac{4}{5} \div 10$	26. $5\frac{2}{3} \div 2\frac{5}{6}$

Solve each word problem, showing all work.

27. Jaimie ran $3\frac{1}{2}$ miles on Monday. She ran half as far on Tuesday as she did on Monday. How far did Jaimie run in all on Monday and Tuesday?	28. A $5\frac{1}{2}$ quart pot is filled $\frac{2}{3}$ of the way with water. How many more quarts of water can the pot hold?

Ratios

Ratios are comparisons of two quantities. There are 3 different ways to write ratios:

- Fraction $\left(\dfrac{A}{B}\right)$
- Colon (A:B)
- Word Form (A to B)

Ratios can be simplified just like fractions.

ex: write the ratio of triangles to circles in 3 ways: ▲ ▲ ▲ ▲ ○ ○

$$\frac{4}{2} = \boxed{\frac{2}{1}, \quad 2:1, \quad 2 \text{ to } 1}$$

Rates & Unit Rates

Rates are ratios that compare quantities measured in different units. A unit rate is a rate with a denominator of 1.

To convert a rate to a unit rate:

1. Divide the numerator by the denominator

2. Either write your answer as a fraction with a label for the both the numerator and denominator OR as one number labeled with the first unit "per" the second unit

ex: express as a unit rate: 125 miles in 4 hours

$$\frac{125 \text{ mi}}{4 \text{ hr}} \qquad 125 \div 4 = 31.25$$

$$\boxed{\frac{31.25 \text{ mi}}{1 \text{ hr}} \text{ or } 31.25 \text{ miles per hr}}$$

Fractions, Decimals, & Percent

To convert a:

- <u>Decimal to Percent</u>: move the decimal point 2 places to the right

    ex: $0.345 = \boxed{34.5\%}$

- <u>Percent to Decimal</u>: move the decimal point 2 places to the left

    ex: $7\% = \boxed{0.07}$

- <u>Decimal to Fraction</u>: write the decimal over the place value of the last digit and then simplify

    ex: $0.008 = \dfrac{8}{1000} = \boxed{\dfrac{1}{125}}$

- <u>Fraction to Decimal</u>: divide the numerator by the denominator

    ex: $\dfrac{1}{5} = 5\overline{)1.0}^{\,\boxed{0.2}}$

- <u>Percent to Fraction</u>: write the percent over 100 and then simplify

    ex: $45\% = \dfrac{45}{100} = \boxed{\dfrac{9}{20}}$

- <u>Fraction to Percent</u>: convert the fraction to a decimal and then convert the decimal to a percent

    ex: $\dfrac{3}{10} = 0.3 = \boxed{30\%}$

Percent of a Number

1. Turn the percent to a fraction or decimal.
2. Multiply the fraction/decimal by the number.

ex: Find 18% of 40

$$0.18 \cdot 40 = \boxed{7.2}$$

Write each ratio in 3 ways.

29. A bank contains 15 pennies and 12 nickels. Write the ratio of nickels to pennies.	30. A bowl contains 6 apples and some bananas. If there are a total of 10 pieces of fruit, find the ratio of apples to bananas.

Convert each rate to a unit rate.

31. $4.25 for 64 fluid ounces	32. 297 miles on 11 gallons of gas	33. 124 feet in 10 seconds

Complete the chart by converting each number to a percent, fraction, and/or decimal.

	Fraction	Decimal	Percent
34.	$\frac{3}{8}$		
35.		0.45	
36.			72%
37.		0.1	
38.	$\frac{3}{200}$		

Find each percent of a number.

39. 30% of 90	40. 15% of 38	41. 50% of 86
42. 75% of 160	43. 24% of 35	44. 2% of 74

Comparing Integers

Integers are numbers without fractional parts. They can be positive, negative, or zero. The further right a number on the number line, the greater it is.
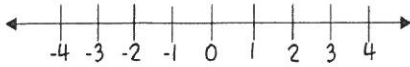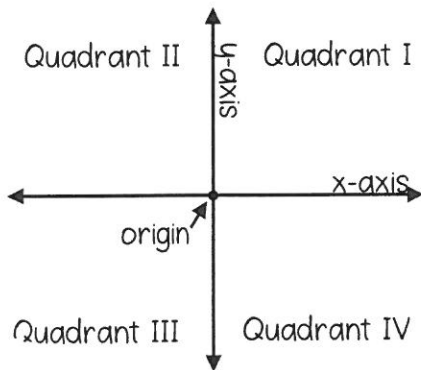

The absolute value of a number is the distance the number is from zero.

ex: compare with <, >, or =

-7 ◯ $|-9|$ ← The absolute value of -9 = 9

-7 | < | 9

The Coordinate Plane

Quadrant II   Quadrant I

y-axis

x-axis

origin

Quadrant III   Quadrant IV

Ordered Pair: (x, y)

To graph a point on the coordinate plane, start at the origin. The first number in the ordered pair (the x-coordinate) tells you how far left (if negative) or right (if positive) to move. The second number (the y-coordinate) tells you how far up (if positive) or down (if negative) to move.

ex: Graph the point (-3, 2) and state the quadrant in which it is located.

Start at the origin, and move LEFT 3 and UP 2
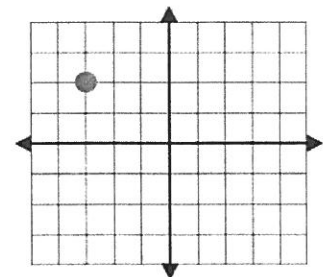
| Quadrant II |

Perimeter, Area and Volume

- Perimeter of Any Polygon: add all side lengths
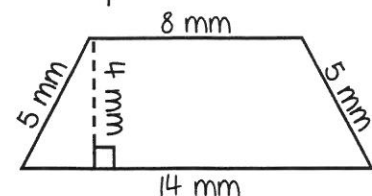
- Area of a Rectangle: $A = lw$

- Area of Parallelogram: $A = bh$

- Area of Triangle: $A = \frac{1}{2}bh$

- Area of Trapezoid: $A = \frac{1}{2}h(b_1 + b_2)$

- Volume of Rectangular Prism: $V = lwh$

ex: Find the perimeter & area:

8 mm
5 mm   4 mm   5 mm
14 mm

Perimeter: $P = 5 + 8 + 5 + 14 =$ | 32 mm |

Area: This is a trapezoid, so use the area of a trapezoid formula: $A = \frac{1}{2}h(b_1 + b_2)$

The bases are the sides that are parallel, and the height is perpendicular to the bases.
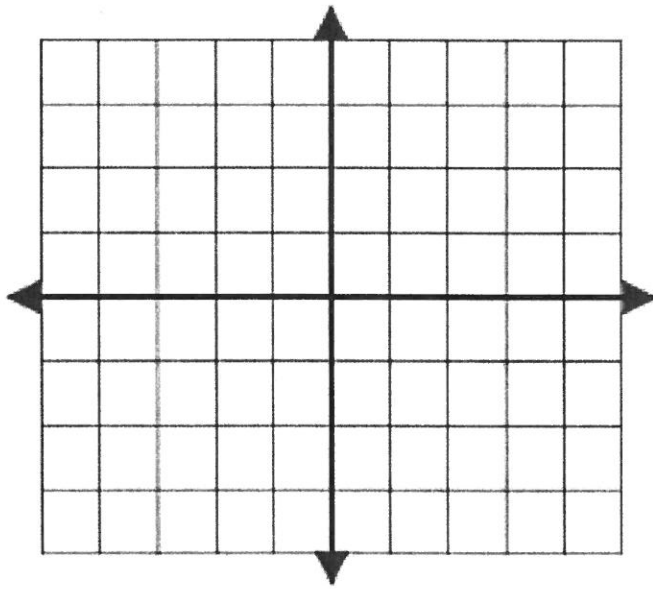
→ $A = \frac{1}{2}(4)(8+14)$ = | 44 mm² |
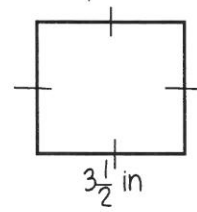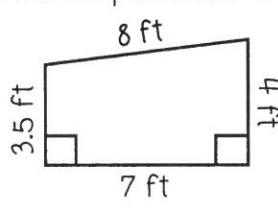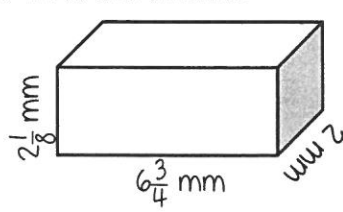
Compare the integers with <, >, or =.
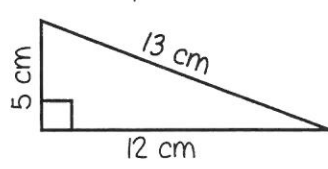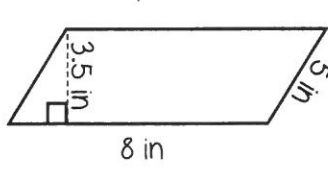
45. -4 ◯ -5	46. 2 ◯ -2	47. |−5| ◯ |5|	48. -7 ◯ 6	49. -13 ◯ -9
50. |−7| ◯ -6	51. -17 ◯ -14	52. |−3| ◯ |−2|	53. 0 ◯ -6	54. |−4| ◯ |6|

Graph and label each of the ordered pairs in the coordinate plane. Then state the quadrant or axis in/on which the point is located.

55. A(2, 4)	56. B(0, -3)	
57. C(1, -1)	58. D(3, 3)	
59. E(-4, 1)	60. F(2, 0)	
61. G(-3, -2)	62. H(-2, 3)	
63. I(0, 2)	64. J(-1, -4)	

Find the perimeter, area, and/or volume of the given figure.

65. Find the perimeter & area:	66. Find the perimeter & area:	67. Find the perimeter & area:
5 cm, 13 cm, 12 cm (right triangle)	3.5 in, 5 in, 8 in (parallelogram)	$3\frac{1}{2}$ in (square)
68. Find the perimeter & area:	69. Find the area of a square with a perimeter of 45 cm	70. Find the volume:
3.5 ft, 8 ft, 4 ft, 7 ft (trapezoid)		$2\frac{1}{8}$ mm, $6\frac{3}{4}$ mm, 2 mm (rectangular prism)

Evaluating Algebraic Expressions

1. Substitute the given numbers for the variables

2. Evaluate the expression using the order of operations

ex: evaluate $x + 4y$ for $x = 4$ & $y = 6$

$$4 + 4(6)$$
$$4 + 24 = \boxed{28}$$

One-Step Addition & Subtraction Equations

- <u>Addition Equations</u>: Subtract the number being added to the variable from both sides of the equation

ex: $\begin{array}{r} 4 + x = 18 \\ -4 \quad\quad -4 \\ \hline \boxed{x = 14} \end{array}$

- <u>Subtraction Equations</u>: Add the number being subtracted from the variable to both sides of the equation

ex: $\begin{array}{r} 20 = a - 5 \\ +5 \quad\quad +5 \\ \hline 25 = a \rightarrow \boxed{a = 25} \end{array}$

One-Step Multiplication & Division Equations

- <u>Multiplication Equations</u>: Divide both sides of the equation by the number next to the variable

ex: $\begin{array}{r} \dfrac{7b}{7} = \dfrac{28}{7} \\ \boxed{b = 4} \end{array}$

- <u>Division Equations</u>: Multiply both sides of the equation by the number under the variable

ex: $5 \cdot \dfrac{n}{5} = 10 \cdot 5$

$$\boxed{n = 50}$$

Problem Solving

1. Read the problem. Identify the question that is being asked and the key information in the problem.

2. Plan how you are going to solve the problem and estimate the answer.

3. Solve the problem using the strategy of your choice.

4. Check your answer. Make sure your answer is reasonable and compare it to your estimate. Label your answer with appropriate units.

Evaluate each expression for a = 5, b = 12, c = 10, & d = 2.

71. $2b - a$	72. $d(ab - c)$	73. $3 + \dfrac{b}{d}$
74. $\dfrac{4a}{b + 4d}$	75. $2a^2 - c$	76. $b - c + d$

Solve each one-step equation.

77. $g + 3 = 17$	78. $r - 6 = 7$	79. $6b = 18$	80. $\dfrac{h}{9} = 3$
81. $5 = f - 8$	82. $48 = 12b$	83. $a + 24 = 83$	84. $17 + x = 23$
85. $10 = \dfrac{m}{5}$	86. $86.5 = f - 7.63$	87. $\dfrac{n}{6} = 11$	88. $\dfrac{3}{4}h = 12$

Solve each word problem using the method of your choice.

89. A fencing company charges $22 per foot to install a wood fence. How much will it cost to install a wood fence around a rectangular pool area that is 20 feet wide and 38 feet long?	90. A 6 inch-tall plant grew ¾ of an inch one week and twice as much the following week. How tall is the plant now?
91. Jack can read 45 pages of his book in one and a half hours. At that rate, how long will it take him to read the entire 300-page book?	92. Brian ordered 3 large cheese pizzas and a salad. The salad cost $4.95. If he spent a total of $47.60 including the $5 tip, how much did each pizza cost? (Assume there is no tax).
93. A cookie recipe calls for $3\frac{1}{4}$ cups of flour. The recipe makes 3 dozen cookies. How much four is needed to make 144 cookies?	94. Ella has a box of chocolate candies. She gives $\frac{1}{3}$ of the candies to her sister, 4 to her brother, and she eats the remaining 12 candies. How many chocolate candies were in the box originally?

Solve each word problem using the method of your choice.

95. 20% of the 520 students in Wendover Middle School were involved in school sports. Of those students, 12.5% were on the wrestling team. How many students were on the wrestling team?	96. A piggy bank contains some dimes and nickels. There are 8 more dimes than nickels in the bank. There is a total of $1.40. How many of each type of coin are in the bank?
97. An elevator in a tall building goes up 7 floors, then down 9 floors, down 4 floors, up 8 floors, and down 2 floors. Now it is on floor 14. On what floor did the elevator start?	98. Jenna danced for 3 hours on Sunday, 2 hours on Monday and Tuesday, 1 hour on Thursday, 1.5 hours on Friday, and 2 hours on Saturday. She did not dance at all on Wednesday. What is the average number of hours she danced each day? Round your answer to the nearest tenth of an hour.
99. Jackie makes $15.25/hour babysitting. George makes $18.50/hour mowing the lawn. If Jackie babysits for 4 hours and George mows lawns for 3 hours, who makes more money? How much more does he/she make?	100. A box of 8 crayons costs $0.96. How much does each crayon cost? At that unit price, how much would a box of 30 crayons cost?

Summer Math Answer Key

The Summer Before 7th Grade

SEACREST
COUNTRY DAY SCHOOL

Answer Key

Find the sum. Write your answer in simplest form.

1. $\frac{1}{4} + \frac{1}{2}$ $\frac{3}{4}$	2. $\frac{2}{5} + \frac{1}{3}$ $\frac{11}{15}$	3. $\frac{7}{15} + \frac{3}{10}$ $\frac{23}{30}$	4. $\frac{11}{28} + \frac{4}{7}$ $\frac{27}{28}$
5. $\frac{3}{4} + \frac{1}{12}$ $\frac{5}{6}$	6. $\frac{9}{10} + \frac{13}{20}$ $1\frac{11}{20}$	7. $4\frac{15}{16} + 7\frac{3}{4}$ $12\frac{11}{16}$	8. $2\frac{16}{25} + 3\frac{18}{20}$ $6\frac{27}{50}$
9. $3\frac{2}{5} + 9\frac{1}{10}$ $12\frac{1}{2}$	10. $6\frac{1}{42} + 4\frac{5}{6}$ $10\frac{6}{7}$	11. $18\frac{7}{9} + 16$ $34\frac{7}{9}$	12. $4\frac{7}{8} + \frac{1}{3}$ $5\frac{5}{24}$

Find the difference. Write your answer in simplest form.

13. $\frac{7}{8} - \frac{1}{4}$ $\frac{5}{8}$	14. $\frac{13}{15} - \frac{1}{3}$ $\frac{8}{15}$	15. $\frac{7}{9} - \frac{2}{6}$ $\frac{4}{9}$	16. $\frac{21}{24} - \frac{3}{8}$ $\frac{1}{2}$
17. $\frac{3}{14} - \frac{1}{7}$ $\frac{1}{14}$	18. $\frac{9}{10} - \frac{1}{2}$ $\frac{2}{5}$	19. $9 - 4\frac{1}{12}$ $4\frac{11}{12}$	20. $12\frac{18}{25} - 8\frac{4}{5}$ $3\frac{23}{25}$
21. $5\frac{8}{9} - 3\frac{2}{3}$ $2\frac{2}{9}$	22. $8\frac{12}{16} - 7\frac{31}{32}$ $\frac{25}{32}$	23. $10\frac{3}{4} - 6\frac{4}{5}$ $3\frac{19}{20}$	24. $13\frac{7}{8} - \frac{10}{12}$ $13\frac{1}{24}$

Answer Key

Find the product. Write your answer in simplest form.

25. $\frac{1}{8} \cdot \frac{1}{7}$ $\frac{1}{56}$	26. $\frac{2}{9} \cdot \frac{12}{14}$ $\frac{4}{21}$	27. $\frac{7}{12} \cdot \frac{8}{14}$ $\frac{1}{3}$	28. $\frac{9}{24} \cdot \frac{16}{81}$ $\frac{2}{27}$
29. $\frac{3}{14} \cdot \frac{21}{33}$ $\frac{3}{22}$	30. $\frac{1}{2} \cdot \frac{9}{13}$ $\frac{9}{26}$	31. $2\frac{1}{6} \cdot \frac{3}{5}$ $1\frac{3}{10}$	32. $8\frac{4}{5} \cdot 1\frac{5}{11}$ $12\frac{4}{5}$
33. $2\frac{1}{2} \cdot \frac{2}{5}$ 1	34. $9\frac{2}{3} \cdot 6$ 58	35. $13\frac{1}{3} \cdot 2\frac{1}{10}$ 28	36. $7 \cdot \frac{1}{3}$ $2\frac{1}{3}$

Find the quotient. Write your answer in simplest form.

37. $\frac{5}{6} \div \frac{1}{4}$ $3\frac{1}{3}$	38. $\frac{1}{2} \div \frac{1}{4}$ 2	39. $\frac{3}{4} \div \frac{9}{12}$ 1	40. $\frac{21}{35} \div \frac{7}{25}$ $2\frac{1}{7}$
41. $\frac{6}{7} \div 3$ $\frac{2}{7}$	42. $\frac{2}{11} \div \frac{1}{33}$ 6	43. $1\frac{1}{4} \div 2\frac{1}{3}$ $\frac{15}{28}$	44. $5\frac{3}{6} \div 3$ $1\frac{5}{6}$
45. $10\frac{1}{4} \div \frac{2}{5}$ $25\frac{5}{8}$	46. $3\frac{2}{3} \div 1\frac{1}{7}$ $3\frac{5}{24}$	47. $4\frac{3}{8} \div \frac{9}{10}$ $4\frac{31}{36}$	48. $8 \div \frac{3}{4}$ $10\frac{2}{3}$

Find the sum or difference.

49. 6.2 + 3.4	50. 8.04 − 6.8	51. 12.4 + 0.899	52. 12.9 − 2.043
9.6	1.24	13.299	10.857
53. 163.29 + 13.987	54. 13 − 6.7	55. 3.91 + 1.93	56. 34.2 − 29.027
177.277	6.3	5.84	5.173

Find the product.

57. 9.2 · 3.1	58. (14.1)(2.7)	59. 91 × 4.5	60. 82.04 × 1.2
28.52	38.07	409.5	98.448
61. (1.1)(6.78)	62. 45 · 0.1	63. 0.010 × 13.9	64. (2.34)(5.6)
7.458	4.5	0.139	13.104

Find the quotient.

65. 8.4 ÷ 2	66. 1.56 ÷ 1.3	67. 7.45 ÷ 2	68. 9 ÷ 0.8
4.2	1.2	3.725	11.25
69. 68 ÷ 3.4	70. 9.4 ÷ 0.2	71. 0.045 ÷ 0.15	72. 4 ÷ 0.3
20	47	0.3	$13.\overline{3}$

Answer Key

Find the area and perimeter (or circumference) of each figure. Use 3.14 for π.
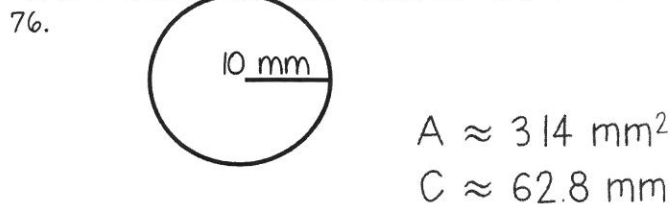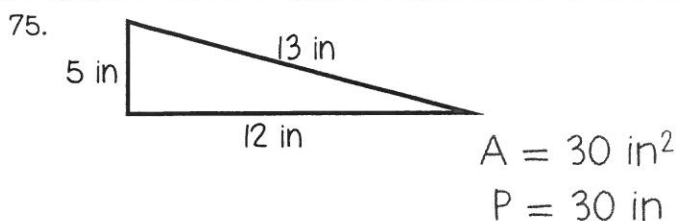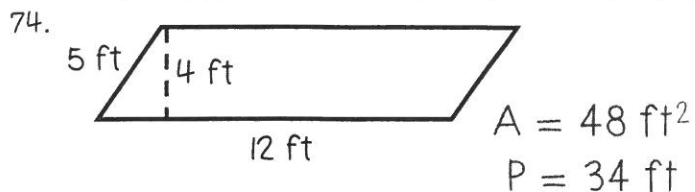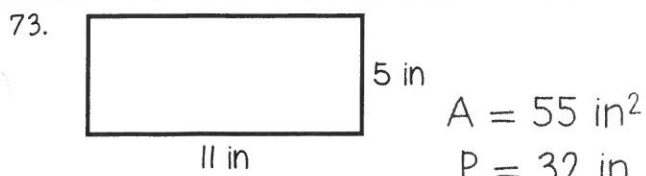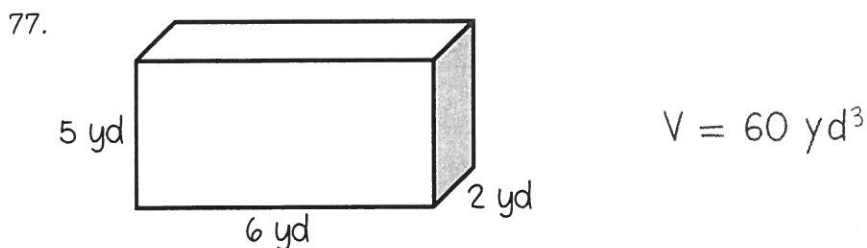
73.

5 in
11 in

$A = 55\ in^2$
$P = 32\ in$

74.

5 ft   4 ft
12 ft

$A = 48\ ft^2$
$P = 34\ ft$

75.

13 in
5 in
12 in

$A = 30\ in^2$
$P = 30\ in$

76.

10 mm

$A \approx 314\ mm^2$
$C \approx 62.8\ mm$

Find the volume.

77.

5 yd
6 yd
2 yd

$V = 60\ yd^3$

Solve each word problem.

78. Danny is installing a fence around his rectangular yard. His yard is 20 feet long by 45 feet wide. If the fencing he picked out costs \$25 per foot, how much money will Danny spend on the fence?

$3,250

79. Tameka wants to put a carpet in her rectangular bedroom. Her room is 22 feet long by 18 feet wide. How much carpeting will Tameka need?

$396\ ft^2$

80. Don wants to bring some sand home from his vacation at the beach. He has a box that is 3 inches wide, 4 inches long, and 2 inches tall. How much sand can he fit in the box?

$24\ in^3$

Answer Key

Solve each one-step equation for the given variable.

81. $x + 18 = 32$ $x = 14$	82. $18f = 720$ $f = 40$	83. $h - 56 = 57$ $h = 113$	84. $\frac{b}{6} = 12$ $b = 72$
85. $12 = r - 76$ $r = 88$	86. $33 + d = 65$ $d = 32$	87. $14m = 42$ $m = 3$	88. $10c = 5$ $c = \frac{1}{2}$
89. $38 = 19j$ $j = 2$	90. $w + 65 = 100$ $w = 35$	91. $r - 7 = 9$ $r = 16$	92. $x \div 12 = 9$ $x = 108$
93. $14 + x = 18$ $x = 4$	94. $\frac{p}{22} = 7$ $p = 154$	95. $47 = x - 5$ $x = 52$	96. $k + 16 = 76$ $k = 60$
97. $2 = 6m$ $m = \frac{1}{3}$	98. $t - 8 = 14$ $t = 22$	99. $\frac{h}{19} = 11$ $h = 209$	100. $47 = 18 + b$ $b = 29$

Answer Key

Evaluate each expression.

1. $5.983 + 2.99$ 8.973	2. $224 - 56.73$ 167.27	3. $6.12 - 4.923$ 1.197
4. $24.5 \cdot 3.2$ 78.4	5. $0.23 \cdot 7$ 1.61	6. $3.86 \cdot 9.15$ 35.319
7. $14.8 \div 5$ 2.96	8. $46.3 \div 1.5$ $30.8\overline{6}$	9. $147 \div 2.25$ $65.\overline{3}$
10. $24.33 - 2.5 \cdot 7$ 6.83	11. $3.9 + 4.5^2$ 24.15	12. $9.25(18.4 - 2 \cdot 1.2)$ 148

Solve each word problem, showing all work.

13. Jeff had $46.18 in his wallet Monday morning. He gave half of his money to his brother. He then bought two donuts for $0.75 each and a cup of coffee for $2.99. How much money did Jeff have left? $18.60	14. Five friends split a $65.20 bill at a restaurant. They also each left $2.75 for the tip. How much money did each person pay in all? $15.79

Answer Key

Evaluate each expression.

15. $\frac{4}{5} + \frac{3}{4}$ $1\frac{11}{20}$	16. $4\frac{2}{7} + 2\frac{9}{14}$ $6\frac{13}{14}$	17. $8\frac{11}{12} + 9\frac{5}{18}$ $18\frac{7}{36}$
18. $6 - \frac{3}{8}$ $5\frac{5}{8}$	19. $8\frac{3}{5} - 2\frac{1}{3}$ $6\frac{4}{15}$	20. $4\frac{1}{6} - \frac{8}{9}$ $3\frac{5}{18}$
21. $\frac{4}{25} \cdot \frac{15}{16}$ $\frac{3}{20}$	22. $2\frac{3}{4} \cdot 8$ 22	23. $6\frac{5}{8} \cdot 3\frac{1}{2}$ $23\frac{3}{16}$
24. $\frac{7}{9} \div \frac{2}{3}$ $1\frac{1}{6}$	25. $\frac{4}{5} \div 10$ $\frac{2}{25}$	26. $5\frac{2}{3} \div 2\frac{5}{6}$ 2

Solve each word problem, showing all work.

27. Jaimie ran $3\frac{1}{2}$ miles on Monday. She ran half as far on Tuesday as she did on Monday. How far did Jaimie run in all on Monday and Tuesday? $5\frac{1}{4}$ miles	28. A $5\frac{1}{2}$ quart pot is filled $\frac{2}{3}$ of the way with water. How many more quarts of water can the pot hold? $1\frac{5}{6}$ quarts

Answer Key

Write each ratio in 3 ways.

29. A bank contains 15 pennies and 12 nickels. Write the ratio of nickels to pennies.	30. A bowl contains 6 apples and some bananas. If there are a total of 10 pieces of fruit, find the ratio of apples to bananas.
4:5, 4 to 5, $\frac{4}{5}$	3:2, 3 to 2, $\frac{3}{2}$

Convert each rate to a unit rate.

31. $4.25 for 64 fluid ounces	32. 297 miles on 11 gallons of gas	33. 124 feet in 10 seconds
$0.07 per floz	27 mi/gal	12.4 ft/sec

Complete the chart by converting each number to a percent, fraction, and/or decimal.

	Fraction	Decimal	Percent
34.	$\frac{3}{8}$	0.375	37.5%
35.	$\frac{9}{20}$	0.45	45%
36.	$\frac{18}{25}$	0.72	72%
37.	$\frac{1}{10}$	0.1	10%
38.	$\frac{3}{200}$	0.015	1.5%

Find each percent of a number.

39. 30% of 90	40. 15% of 38	41. 50% of 86
27	5.7	43
42. 75% of 160	43. 24% of 35	44. 2% of 74
120	8.4	1.48

Compare the integers with <, >, or =.

45. -4 ⊚> -5	46. 2 ⊚> -2	47. |−5| ⊚= |5|	48. -7 ⊚< 6	49. -13 ⊚< -9
50. |−7| ⊚> -6	51. -17 ⊚< -14	52. |−3| ⊚> |−2|	53. 0 ⊚> -6	54. |−4| ⊚< |6|

Graph and label each of the ordered pairs in the coordinate plane. Then state the quadrant or axis in/on which the point is located.

55. A(2, 4)
  Quadrant I
	56. B(0, -3)
	  y-axis	

57. C(1, -1) Quadrant IV	58. D(3, 3) Quadrant I	
59. E(-4, 1) Quadrant II	60. F(2, 0) x-axis	
61. G(-3, -2) Quadrant III	62. H(-2, 3) Quadrant II	

63. I(0, 2)
  y-axis
	64. J(-1, -4)
	  Quadrant III	

Find the perimeter, area, and/or volume of the given figure.

65. Find the perimeter & area:	66. Find the perimeter & area:	67. Find the perimeter & area:
5 cm, 13 cm, 12 cm P = 30 cm A = 30 cm²	3.5 in, 5 in, 8 in P = 26 in A = 28 in²	$3\frac{1}{2}$ in P = 14 in $A = 12\frac{1}{4}$ in²
68. Find the perimeter & area:	69. Find the area of a square with a perimeter of 45 cm	70. Find the volume:
8 ft, 3.5 ft, 4 ft, 7 ft P = 22.5 ft A = 26.25 ft²	$A = 126\frac{9}{16}$ cm² (or 126.5625 cm²)	$2\frac{1}{8}$ mm, $6\frac{3}{4}$ mm, 2 mm $V = 28\frac{11}{16}$ mm³

Answer Key

Evaluate each expression for $a = 5$, $b = 12$, $c = 10$, & $d = 2$.

71. $2b - a$	72. $d(ab - c)$	73. $3 + \dfrac{b}{d}$
19	100	9
74. $\dfrac{4a}{b + 4d}$	75. $2a^2 - c$	76. $b - c + d$
1	40	4

Solve each one-step equation.

77. $g + 3 = 17$	78. $r - 6 = 7$	79. $6b = 18$	80. $\dfrac{h}{9} = 3$
$g = 14$	$r = 13$	$b = 3$	$h = 27$
81. $5 = f - 8$	82. $48 = 12b$	83. $a + 24 = 83$	84. $17 + x = 23$
$f = 13$	$b = 4$	$a = 59$	$x = 6$
85. $10 = \dfrac{m}{5}$	86. $86.5 = f - 7.63$	87. $\dfrac{n}{6} = 11$	88. $\dfrac{3}{4}h = 12$
$m = 50$	$f = 94.13$	$n = 66$	$h = 16$

Solve each word problem using the method of your choice.

89. A fencing company charges $22 per foot to install a wood fence. How much will it cost to install a wood fence around a rectangular pool area that is 20 feet wide and 38 feet long? $2,552	90. A 6 inch-tall plant grew ¾ of an inch one week and twice as much the following week. How tall is the plant now? $8\frac{1}{4}$ inches tall
91. Jack can read 45 pages of his book in one and a half hours. At that rate, how long will it take him to read the entire 300-page book? 10 hours	92. Brian ordered 3 large cheese pizzas and a salad. The salad cost $4.95. If he spent a total of $47.60 including the $5 tip, how much did each pizza cost? (Assume there is no tax). $12.55
93. A cookie recipe calls for $3\frac{1}{4}$ cups of flour. The recipe makes 3 dozen cookies. How much four is needed to make 144 cookies? 13 cups of flour	94. Ella has a box of chocolate candies. She gives $\frac{1}{3}$ of the candies to her sister, 4 to her brother, and she eats the remaining 12 candies. How many chocolate candies were in the box originally? 24 chocolate candies

Answer Key

Solve each word problem using the method of your choice.

95. 20% of the 520 students in Wendover Middle School were involved in school sports. Of those students, 12.5% were on the wrestling team. How many students were on the wrestling team? 13 students	96. A piggy bank contains some dimes and nickels. There are 8 more dimes than nickels in the bank. There is a total of $1.40. How many of each type of coin are in the bank? 4 nickels & 12 dimes
97. An elevator in a tall building goes up 7 floors, then down 9 floors, down 4 floors, up 8 floors, and down 2 floors. Now it is on floor 14. On what floor did the elevator start? the 14th floor	98. Jenna danced for 3 hours on Sunday, 2 hours on Monday and Tuesday, 1 hour on Thursday, 1.5 hours on Friday, and 2 hours on Saturday. She did not dance at all on Wednesday. What is the average number of hours she danced each day? Round your answer to the nearest tenth of an hour. about 1.6 hours
99. Jackie makes $15.25/hour babysitting. George makes $18.50/hour mowing the lawn. If Jackie babysits for 4 hours and George mows lawns for 3 hours, who makes more money? How much more does he/she make? Jackie makes $5.50 more than George.	100. A box of 8 crayons costs $0.96. How much does each crayon cost? At that unit price, how much would a box of 30 crayons cost? $3.60