Grade 4 Curriculum Overview

Operations and Algebraic Thinking

- Solve equations using the four operations with a letter representing the unknown quantity (variable).
- Find factors for given numbers (e.g. Circle all the factors of 12).
- Determine multiples (e.g. Is 20 a multiple of 4?).
- Determine the order of operations in a word problem.
- Determine which of the four operations to use in a number problem.
- Extend numbers patterns and state the rule.

Numbers and Operations in Base Ten

- Order and compare place value to 1,000,000.
- Rewrite numbers using expanded form.
- Compare the place value of multi-digit whole numbers using symbols for greater than, less than or equal to.
- Round multi-digit whole numbers to any place.
- Use rectangular array to find the missing multiplicand and the multiplier.
- Multiply up to a four-digit number by a one-digit number.
- Multiply two-digit numbers by a two-digit number using the distributive property.
- Multiply by 1 and 0 and divide by 1.
- Solve multiplication problems using models (e.g. 4 x 3 = 3 sets of 4).
- Divide up to a three-digit number by a one-digit number.
- Add and subtract with five-digit numbers both horizontally and vertically.
- Find a reasonable solution.
- Convert written multiples of 10 to numerals (e.g. 10 thousands = 10,000).
- Use expanded notation (e.g. 5815 = 5000 + 800 + 10 + 5).
- Complete fact families using the inverse relationships of: multiplication and division, addition and subtraction.
- Read numbers and identify place value up to the million's place.
- Convert number words to numerals and numerals to number words.
- Show different equivalencies of numbers (e.g., 2 x 3 x 2 = 6 x 2).
- Solve word problems, including mental math problems, using all four operations.
- Estimate sums, differences, products, and quotients.
- Identify 10, 100, and 1,000 more or less than a given number.
- Determine the decimal and percent equivalence of 1/4, 1/2, 1/10, 1/100.
- Compare and order decimals to two decimal places.
- Compare decimals using symbols for greater than, less than or equal to.
- Round decimals to nearest tenth and whole.
- Add and subtract decimals to two places.
- Solve problems using percentages.
- Determine if a number is a prime or composite number.
- Solve multi-step word problems.
- Solve word problems with missing or extra information.
- Solve word problems using money, time, and distance.

Numbers and Operations – Fractions

- Decompose a fraction into a sum of fractions (e.g. 5/6 = 1/6 + 1/6 + 1/6 + 1/6 + 1/6).
- Add and subtract mixed numbers with like denominators.
- Solve addition and subtraction word problems involving fractions.
- Multiply a fraction by a whole number (e.g. 3/2 = 1/2 x 3).
- Solve word problems using multiplication of a fraction by a whole number.
- Rewrite fractions into decimals; rewrite decimals into fractions.
- Identify fractions using circle graph models.
- Compare and order fractions (mixed and improper fractions) with and without a number line.
- Compare fractions with like and unlike denominators.

- Convert fractions greater than one to mixed numbers (e.g. 4/3 = 1 1/3).
- Determine equivalent fractions (e.g. 1/2 = 2/4 = 10/20).
- Reduce fractions.
- Order both fractions and decimals on a number line.

Measurement and Data

- Convert within a system of measurement (e.g. 3 feet in a yard).
- Determine the appropriate unit of measurement to use (e.g. kilometers to measure distance).
- Solve problems involving time, volume, distance and money using simple fractions and decimals.
- Find the area and perimeter of a rectangle.
- Find the unknown factor of a rectangle given the area and length.
- Compare lengths of objects on a fraction number line using 1/8, 1/4, 1/2.
- Given the measurement of an angle in a circle, determine the unknown angle.
- Match angles to their corresponding fractions within a circle (e.g. 90 degree angle = ¼).
- Match the fraction with the degree of a turn (e.g. 1/2 turn = 180 degrees).
- Compare two rectangles that have the same area but different perimeters, and vice versa.
- Interpret data using tallies, line graphs, and pie charts.
- Interpret information on a graph (bar, circle and line).
- Make a tally chart using given information.
- Transfer information on a graph to a chart.

Geometry

- Identify right, acute and obtuse angles.
- Identify perpendicular, parallel and intersecting lines.
- Identify angles (right, acute, obtuse).
- Identify the radius and diameter of a circle.
- Identify trapezoid, pentagon, octagon, rhombus and triangular prism.
- Identify triangles by their angles (e.g. right triangle has one angle that equals 90 degrees).
- Identify the scalene, isosceles and equilateral triangles.

Mathematical Reasoning and Problem Solving

- Determine which piece of information is missing or irrelevant in solving a word problem.
- Determine the reasonableness of the solution to a problem.
- Determine whether an exact or an approximate solution is needed to solve a problem.
- Count the number of possible combinations using four different sets.

Extras: Fraction Cut-Outs, Fraction Puzzles, Hundred Chart, and Math Facts Sharpener Review Sheets

IMPORTANT!
Instructions for Parents

- To use <u>Summer Math Skills Sharpener</u>, simply tear off a page and have your child complete it. The book is designed to be used *3-4 days per week for 10 weeks.*

- Our math books support the Common Core Curriculum and the Standards of all 50 states. Therefore, some materials may not have been presented to your child. **Please allow your child to skip concepts not yet learned. Introduce new concepts only if your child shows readiness.**

- Check answers immediately for optimal feedback. Solution pages are provided <u>at the back of the book</u>. (**Solution pages represent only ONE method of solving each problem.**) A Lesson Tracker has been included for your convenience.

- "Help Pages" have been added <u>at the front of the book</u> to clarify certain concepts and represent only one way to solve problems.

- Allow your child to use a calculator <u>only</u> for those problems marked "Calculator Skill."

- When solving division problems, students should use remainders when necessary.

- The problems labeled "Hundred Chart" are to be used with the chart <u>at the back of the book</u>. Your child may use beans, buttons, coins, etc. for markers.

- "Math Fact Sharpener"pages are located at the back of the book. Have your child complete one side of each of the five pages weekly.

- When solving fraction problems, students should reduce answers to the lowest possible terms.

- The problems labeled "Hands on Fraction" may be solved with the help of the "Fraction Cut-Outs" <u>at the back of the book</u>. Save them to use throughout the book. For example, with unlike denominators:
    1/4 + 3/8: Trade the 1/4 piece for two 1/8 pieces and add.

- Two "Fraction Fun Puzzle" pages are located a<u>t the back of the book</u> and may be completed at any time.

- A "Glossary of Terms" and a "Table of Measurements" are <u>at the back of the book</u>.

- Adjust the program to vacations, etc. Presentation of mixed concepts on every page ensures that all skills are reinforced; therefore, pages may be completed in any order.

- If your child experiences difficulty with concepts that have been already taught, address the problem with his or her teacher in the fall; more consistent problems indicate that a tutor may be needed.

MULTIPLES

To find the *multiples* of a number, multiply the number by other whole numbers. The list is infinite.

Example:

$$3 \times 1 = \underline{3}$$
$$3 \times 2 = \underline{6}$$
$$3 \times 3 = \underline{9}$$
$$3 \times 4 = \underline{12}$$

and so on

} Multiples of 3.

Some numbers share some of the same multiples. Those multiples are known as *common multiples*.

Example:

Multiples of 2	Multiples of 3
$2 \times 1 = \underline{2}$	$3 \times 1 = \underline{3}$
$2 \times 2 = \underline{4}$	$3 \times 2 = \boxed{6}$
$2 \times 3 = \boxed{6}$	$3 \times 3 = \underline{9}$

6 is a *common multiple* of 2 and 3

If we were to look for more *multiples* of 2 and 3, we could go on forever. Usually, we try to find the *least common multiple* (LCM) or the lowest number in value that is common to both.

Example: Find the LCM of 2 and 3.

Multiples of 2	Multiples of 3
$2 \times 1 = \underline{2}$	$3 \times 1 = \underline{3}$
$2 \times 2 = \underline{4}$	$3 \times 2 = \boxed{6}$
$2 \times 3 = \boxed{6}$	$3 \times 3 = \underline{9}$
$2 \times 4 = \underline{8}$	$3 \times 4 = \underline{12}$
$2 \times 5 = \underline{10}$	$3 \times 5 = \underline{15}$

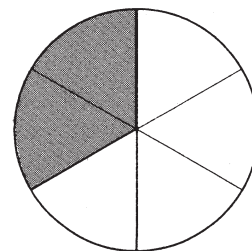The *least common multiple* (LCM) is 6 because it is the lowest number in value of all the multiples of 2 and 3.

1.   a.   8 2 7
                  x   3

      b. $9\overline{)546}$

2. $\frac{2}{6}$ of this circle is shaded.

      a. What fraction is not shaded? _____

      b. Is the shaded area equal to $\frac{1}{2}$? _____

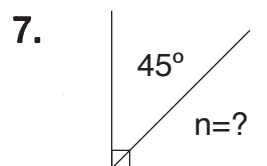3.   a. 11 x 3 = _____   b. 11 x 30 _____

4.   A soup recipe calls for 4 cups of water. Express what part of a gallon this is in

      decimal form. _____

5.   Reasoning: We are two numbers. Our sum is 12. The difference between
      us is 8. What 2 numbers are we?

      _____ + _____ = 12   _____ – _____ = 8

6.   Hands on fraction: Fill in the missing symbol.   < or >

          $\frac{5}{8}$ – $\frac{2}{8}$ $\boxed{}$ $\frac{3}{4}$ – $\frac{1}{4}$

7.   45°   n=?

      Look at the right angle above and solve for n.   n = _____

8. Estimate the quotient by rounding to the nearest dollar:

    a. $31.78 ÷ 4 = _____   b. $20.16 ÷ 5 = _____

9. Underline the composite numbers. Circle the prime numbers:

    3   7   9   11   13   16   19   21

10. Order these decimals from least to greatest:

    .50   .3   .03   .05

    _____   _____   _____   _____

11. Four teams all want to play each other during the season. How many games in all will be played if they play each other only once? _____

12. a. $1\dfrac{3}{4}$ b. $1\dfrac{5}{8}$

       $+\ \dfrac{3}{4}$ $+\ \dfrac{7}{8}$

       _____   _____

13. Does a garden plot that measures 45 feet by 20 feet have the same perimeter as one that measures 15 feet by 55 feet?

    _____

1.   a.   6 , 6 2 3
           − 3 , 5 9 6

     b. 1,354 + 6,976 = _____

2.   Avery bought 2 dozen cupcakes for her softball team. There are nine girls on the team. How many cupcakes will each girl receive? _____ Will Avery have any left over? _____ If so, how many? _____

3.   a.   9 1 6
           x   1 0

     b. $90 \overline{)540}$

4.   Write 4,905 in expanded notation:

     _____ + _____ + _____ + _____ = 4,905

5.   Change these decimals to fractions. Example: $.5 = \frac{5}{10} = \frac{1}{2}$
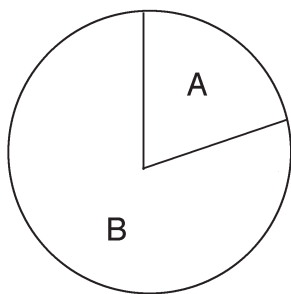
     a.   .25 = _____   b.   .8 = _____

6.   200 + n = 1000.   n = _____

7.   Look at this number: 667,381 and fill in the blank below:

     The "6" with the larger value is worth _____ times

     more than the "6" with the smaller value.

8.

Angle B is 275°. What is angle A? _____

9. Write the equation each array represents.

a. ☆ ☆ ☆
   ☆ ☆ ☆

b. ☆ ☆ ☆ ☆ ☆
   ☆ ☆ ☆ ☆ ☆

c. ☆ ☆ ☆
   ☆ ☆ ☆
   ☆ ☆ ☆

_____   _____   _____

10. Circle which is larger:

14 quarts   3 gallons

11. In baseball all four bases are 90 feet apart. How far would you run if you hit a

"double" (2 bases)? _____ How about a home run (4 bases)? _____

12. Which decimal equals the fraction $\frac{1}{2}$?   .8   .5   .4   _____

13. Match the fraction on the left with an equivalent (equal) fraction on the right:

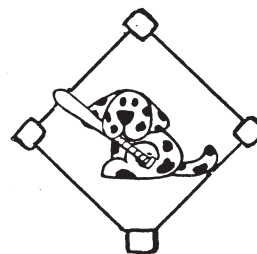$$\frac{3}{4} \qquad\qquad \frac{3}{9}$$

$$1\frac{1}{2} \qquad\qquad \frac{14}{12}$$

$$\frac{1}{3} \qquad\qquad \frac{6}{8}$$

$$\frac{7}{6} \qquad\qquad \frac{3}{2}$$

Lesson #31

1. 567,943
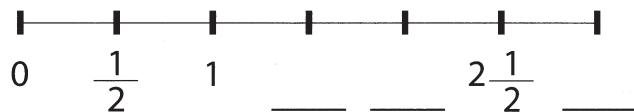
   a. What is the value of the 5? _____

   b. What is the value of the 7? _____

   c. What is the value of the 6? _____

2. Put these decimals in order from least to greatest.

   3.86   3.08   3.06   3.68

   _____   _____   _____   _____

3. Match the number on the left to its equivalent decimal.

   a. $\frac{1}{2}$ 1.00

   b. $\frac{1}{4}$ .50

   c. $\frac{3}{4}$ .25

   d.   1   .75

4. Fill in these improper fractions on the number line below: $\frac{9}{3}$, $\frac{3}{2}$, $\frac{8}{4}$

   0     $\frac{1}{2}$ 1   ____ ____ $2\frac{1}{2}$ ____

5. Circle all of the prime numbers:

   3   6   7   10   11

6. You have $10.00. You buy 3 sodas for $1.75 each. To find out how much money you will have left you would:

   a. Multiply first, then subtract   b. Subtract first, then multiply

   How much will you have left? _____

Lesson #31 continued

7. a. Which figure shows perpendicular lines? _____

    b. Which figure shows parallel lines? _____
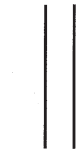
    c. In which figure do the lines intersect? _____
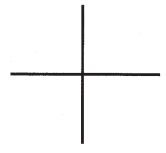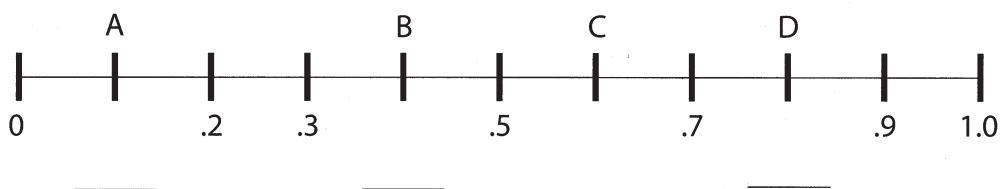
    Figure 1   Figure 2

8. Would 40,000 be a reasonable estimate for 20.106 x 2? _____

9. You have 30 math problems to complete for your homework. You've completed 1/3. How many more do you need to do?

    _____

10. 75 ÷ n = 25.   n = _____

11. Decide whether you would need an exact or estimated measurement.

    a. The number of cookies for the school picnic _____

    b. The amount of medicine to take for an illness _____

12. Fill in these fractions on the number line below: $\frac{1}{10}$ $\frac{8}{10}$ $\frac{6}{10}$ $\frac{4}{10}$

    A   B   C   D

    |——|——|——|——|——|——|——|——|——|——|——|
    0   .2   .3   .5   .7   .9   1.0

    _____   _____   _____   _____

HUNDRED CHART

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Math Facts Sharpener • Grades 3 and 4

2 ×6	3 ×3	5 ×9	9 ×6	8 ×5	3 ×7	6 ×6
7 ×5	8 ×2	3 ×5	5 ×6	6 ×4	7 ×7	9 ×9
2 ×3	3 ×9	7 ×6	5 ×4	9 ×3	2 ×2	4 ×6
6 ×3	9 ×2	2 ×7	5 ×3	3 ×2	9 ×8	2 ×5
4 ×9	5 ×7	6 ×2	8 ×3	4 ×5	6 ×7	9 ×5
6 ×1	3 ×8	2 ×9	8 ×8	4 ×2	4 ×4	6 ×9
8 ×9	1 ×7	5 ×2	4 ×7	7 ×2	9 ×6	7 ×9

WHOLE

$\dfrac{1}{2}$	$\dfrac{1}{2}$

$\dfrac{1}{4}$	$\dfrac{1}{4}$	$\dfrac{1}{4}$	$\dfrac{1}{4}$
$\dfrac{1}{4}$	$\dfrac{1}{4}$	$\dfrac{1}{4}$	$\dfrac{1}{4}$

FRACTION CUT-OUTS

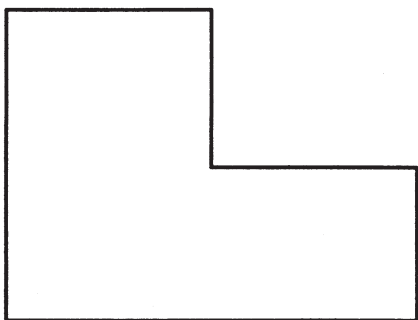|							
$\dfrac{1}{8}$	$\dfrac{1}{8}$	$\dfrac{1}{8}$	$\dfrac{1}{8}$				
$\dfrac{1}{8}$	$\dfrac{1}{8}$	$\dfrac{1}{8}$	$\dfrac{1}{8}$				
$\dfrac{1}{8}$	$\dfrac{1}{8}$	$\dfrac{1}{8}$	$\dfrac{1}{8}$				
$\dfrac{1}{8}$	$\dfrac{1}{8}$	$\dfrac{1}{8}$	$\dfrac{1}{8}$				

Fraction Fun Puzzles

Use your fraction cut-outs to help you solve these puzzles.
The answers are on the back of this page.

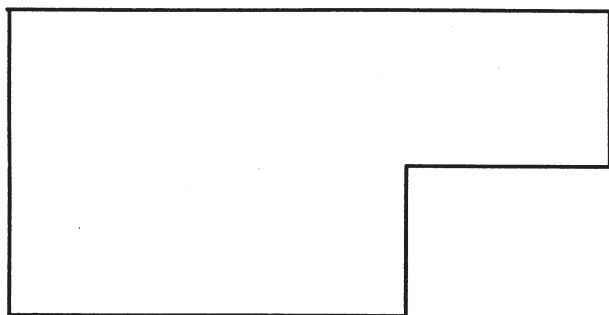**I.** Cover this shape using only 2 pieces.

A. ____ + ____

Now use 3 pieces

B. ____ + ____ + ____

II. Cover this shape using only 2 pieces.

A. ___ + ___

Now use only 3 pieces.

B. ____ + ____ + ____

The Metric Units

Temperature - Celsius
    0°C: the freezing point of water
   37°C: the normal body temperature
 100°C: the boiling point of water

Mass
1000 milligrams (mg) = 1 gram
1000 grams = 1 kilogram (kg)
1000 kilograms = 1 metric ton (t)

Capacity
1000 milliliters (mL) = 1 liter (L)
1000 liters = 1 kiloliter (kL)

Length
10 millimeters (mm) = 1 centimeter
10 centimeters (cm) = 1 decimeter
1000 millimeters (mm) = 1 meter (m)
100 centimeters = 1 meter (m)
10 decimeters (dm) = 1 meter
1000 meters (m) = 1 kilometer (km)

The Customary Units

Temperature - Fahrenheit
    32°F: the freezing point of water
 98.6°F: the normal body
            temperature
 212°F: the boiling point of water

Weight
1 pound (lb) = 16 ounces (oz)
1 ton = 2,000 pounds

Time
1 minute (min) = 60 seconds (s)
1 hour = 60 minutes
1 day = 24 hours
1 week = 7 days
1 month (mo) = approx. 4 weeks
1 year (yr) =

              365 days
              52 weeks
              12 months
1 decade = 10 years
1 century = 100 years

Capacity
1 cup (c) =   8 fluid ounces (fl oz)
1 pint (pt) =   16 fluid ounces
                   2 cups
1 quart (qt) =   32 fluid ounces
                   4 cups
                   2 pints
1 gallon (gal)=   128 fluid ounces
                   16 cups
                   8 pints
                   4 quarts

Length
1 foot (ft) =   12 inches (in)
1 yard (yd) =   36 inches
                   3 feet
1 mile (mi) =   5,280 feet
                   1,760 yards

GLOSSARY OF TERMS AND FORMULAS

a.m.: a way of expressing time between 12:00 midnight and 12:00 noon.

acute angle: an angle measuring less than 90 degrees but greater than 0 degrees.

addends: numbers to be added together in an addition problem.

algebraic expression: an expression that uses at least one letter to represent a number.

angle: where two rays share a common end point.

area: the measure of a region in square units.
     Formulas:
          Quadrilateral: A = length x width
          Triangle: A = $\frac{1}{2}$ x base x height
          Circle: A = $\pi\, r^2$
                    $\pi \approx 3.14$
                    r = radius

average: a number obtained by adding a group of numbers together and dividing by the number of addends.

center: the point from which all points on a circle are equally distant.

circle: a closed, two dimensional curved shape where each point on the circle is the same distance from the center.

circumference: the distance around a circle.
     Formula: c = $2\,\pi\, r$ r = radius $\pi \approx 3.14$

common denominator: the least common multiple of two denominators.

common factor: a number that is a factor of two other numbers is a <u>common</u> factor.
     Example: 3 is a common factor of 9 and 12.

common multiple: a number that is a multiple of two other numbers.
     Example: 24 is a common multiple of 6 and 4.

complementary angle: the number in degrees given to an angle that when added to another angle will give 90 degrees.

composite number: a positive integer which is not prime. It has factors other than 1 and itself. Example: 4, 6, 8, 10...

congruent: being the same.

coordinates: number pairs used in graphing. The horizontal axis is listed first and the vertical axis is listed second.
     Example: 8, 10

customary measurement: units of measurement used in the United States.
     Example: feet, pounds, miles, etc.

decade: a period of 10 years.

decimal point: a period put just before the decimal fraction such as the periods in .625 and .08

degree: a unit used to measure an angle or temperature.

1) $2\times3=6$
$6\times4=24$ (2×3×4)

2) $\begin{array}{r}\;^{6\,9\,9}7006\\-3435\\\hline3571\end{array}$

3) (.09 .90 .99)

4) $64-30=34$ (n=34)

5) Harding to St. Clair   80 miles
St. Clair to Palmersville   60 miles
Harding to Palmersville   100 miles
$\begin{array}{r}80\\+60\\\hline140\end{array}$ $\begin{array}{r}140\\-100\\\hline(40\text{ miles})\end{array}$

6) a. $\begin{array}{r}^4793\\\times6\\\hline(28758)\end{array}$ b. $\begin{array}{r}20\overset{4}{8}8\\\times5\\\hline(10,440)\end{array}$

7) $\frac{3}{6}$ $\left(\frac{1}{6}\right)+\frac{2}{6}=\frac{3}{6}$
$\frac{-2}{6}$
$\frac{1}{6}$

8) a. $\begin{array}{r}(60)\\8\overline{)480}\\48\downarrow\\\hline0\end{array}$ b. $\begin{array}{r}(600)\\8\overline{)4800}\\48\downarrow\downarrow\\\hline000\end{array}$

9) $\begin{array}{r}10\\30\overline{)300}\\30\\\hline00\end{array}$ a. $300\div30=10$
$\begin{array}{r}40\\\times40\\\hline1,600\end{array}$ b. $40\times40=1,600$

10) (a) $5\overline{)2.00}^{.40}$ < b. .45

11) $\begin{array}{l}A>B\\C>D\\D>A\end{array}$ $\begin{array}{ll}1)&C\\2)&D\\3)&A\\4)&B\end{array}$

12) (Jack)
60 miles | 1 hour   Leo
30 miles | ½ hour   70 miles | 1 hour
90 miles | 1½ hour   35 miles | ½ hour
         105 miles | 1½ hour

13) a.(25) b.(5)
c.(5) d.(2)
e.(2) f.(1)

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1) $\begin{array}{r}3\,R10\\50\overline{)160}\\150\\\hline10\end{array}$ $\begin{array}{l}50-1\\50-2\\50-3\\10-(4)\end{array}$

2) a. $210+610=(820)$
b. $610-210=(400)$

3) 4 quarts = 1 gallon   8 pints = 1 gallon
$+2$ quarts $=\frac{1}{2}$ gallon $+4$ pints $=\frac{1}{2}$ gallon
a.(6 quarts) $=1\frac{1}{2}$ gallons   b.(12 pints) $=1\frac{1}{2}$ gallons

4) a. $\begin{array}{r}(102)\\6\overline{)612}\\6\downarrow\\\hline01\downarrow\\0\\\hline12\\12\end{array}$ b. $\begin{array}{r}103\,R4\\6\overline{)622}\\6\downarrow\\\hline02\downarrow\\0\\\hline22\\18\\\hline4\end{array}$

5) $(100\div25=4)$
$(100\div4=25)$

6) $7\times5=(35)$
$7\times5\times2=(70)$

7) a. $\begin{array}{r}96\\\times30\\\hline(2,980)\end{array}$ b. $\begin{array}{r}96\\\times33\\\hline288\\288\\\hline(3,168)\end{array}$

8) (1 quarter = 25¢
1 dime = +10¢
2 pennies = 2¢)
$\overline{37¢}$

9) $\begin{array}{r}^{7\,11\,4\,4}82.24\\-15.89\\\hline(66.35)\end{array}$

10) $\begin{array}{l}3;3\\4;0\\5;8\\6;5\\7;3\end{array}$

11) $\frac{3}{3}$
$+\frac{1}{3}$
$\frac{4}{3}=(1\frac{1}{3})$ $\left(\frac{2}{3}+\frac{2}{3}\right)$ or $\left(\frac{1}{3}+\frac{1}{3}+\frac{1}{3}+\frac{1}{3}\right)$

12) rounded
$\begin{array}{r}7,967\uparrow\;8,000\\+2,028\downarrow\;+2,000\\\hline(b)\;10,000\end{array}$

13) a. $\begin{array}{r}10\\100\overline{)1,000}\end{array}$ b. $\begin{array}{r}20\\100\overline{)2,000}\end{array}$
$100\times(10)=1,000$ $100\times(20)=2,000$

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1) a. $\begin{array}{r}^2827\\\times3\\\hline(2,481)\end{array}$ b. $\begin{array}{r}(60\,R6)\\9\overline{)546}\\54\downarrow\\\hline06\\0\\\hline6\end{array}$

2) a. $\frac{6}{6}$ circle
$-\frac{2}{6}$ shaded
$\left(\frac{4}{6}=\frac{2}{3}\text{ not shaded}\right)$
b. $\frac{2}{6}\neq\frac{1}{2}$ (no)

3) a. $\begin{array}{r}11\\\times3\\\hline(33)\end{array}$ b. $\begin{array}{r}11\\\times30\\\hline(330)\end{array}$

4) 16 cups = 1 gallon
$\frac{4}{16}=\frac{1}{4}=(.25)$

5) $(10+2)=12$
$(10-2)=8$

6) $\frac{5}{8}$ $\frac{3}{4}=\frac{6}{8}$
$-\frac{2}{8}$ $-\frac{1}{4}=\frac{2}{8}$
$\frac{3}{8}$ $\frac{2}{4}=\frac{4}{8}$
(<) $\frac{2}{4}=\frac{4}{8}$

7) a right angle = 90°
$90°-45°=(45°)$

8) a. $\begin{array}{r}^8 31.78\uparrow\$3200\\4\overline{)\$32.00}\\32\\\hline000\end{array}$
b. $\$20.16\downarrow\$20.00$
$(\$4.00)$
$5\overline{)\$20.00}$

9) (3)(7) 9 (11)(13) 16 (19) 21

10) .03 .05 .3 .50

11) $\begin{array}{ll}1\text{ vs }2 & 3\text{ vs }4\\1\text{ vs }3 & 1\text{ vs }4\\2\text{ vs }3 & 2\text{ vs }4\end{array}$ (6)

12) a. $1\frac{3}{4}$
$+\frac{3}{4}$
$1\frac{6}{4}=2\frac{2}{4}=(2\frac{1}{2})$
b. $1\frac{5}{8}$
$+\frac{7}{8}$
$1\frac{12}{8}=2\frac{4}{8}=(2\frac{1}{2})$

13) $\begin{array}{rr}45&15\\45&15\\20&55\\20&55\\\hline130&140\end{array}$ (no)
(see glossary for perimeter)

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1) $\begin{array}{r}\$17.95\\+6.75\\\hline(\$24.70)\end{array}$

2) $\left(\frac{1}{3}\right)$

3) a. $\begin{array}{r}9,282\\-1,000\\\hline(8,282)\end{array}$ b. $\begin{array}{r}9,282\\-100\\\hline(9,182)\end{array}$

4) $\frac{3}{4}$
$+\frac{1}{4}$
$\frac{4}{4}=(1)$

5) a. $\begin{array}{r}609\\\times8\\\hline(4872)\end{array}$ b. $\begin{array}{r}69\\\times38\\\hline552\\207\\\hline(2,622)\end{array}$

6) 4 score = 80 years
$+7$ years
(87 years)

7) $\frac{2}{3}\times\frac{1}{1}=\left(\frac{2}{3}\right)$

$\begin{array}{r}(49)\\3\overline{)147}\\126\\\hline27\end{array}$

8) a. $\begin{array}{r}(57)\\6\overline{)342}\\30\downarrow\\\hline42\\42\end{array}$ b. $\begin{array}{r}(48\,R6)\\7\overline{)342}\\28\downarrow\\\hline62\\56\\\hline6\end{array}$

9) (c) 4 rows of 3 circles

10) (20,322)

11) $\begin{array}{r}1,925\\862\\+2042\\\hline(4829)\end{array}$

12) answers will vary

13) Cassie plus 5 friends = 6
$1\frac{1}{2}=\frac{3}{2}\times\frac{6}{1}=\frac{18}{2}=(9)$ or $\begin{array}{r}1.5\\\times6\\\hline(9.0)\end{array}$