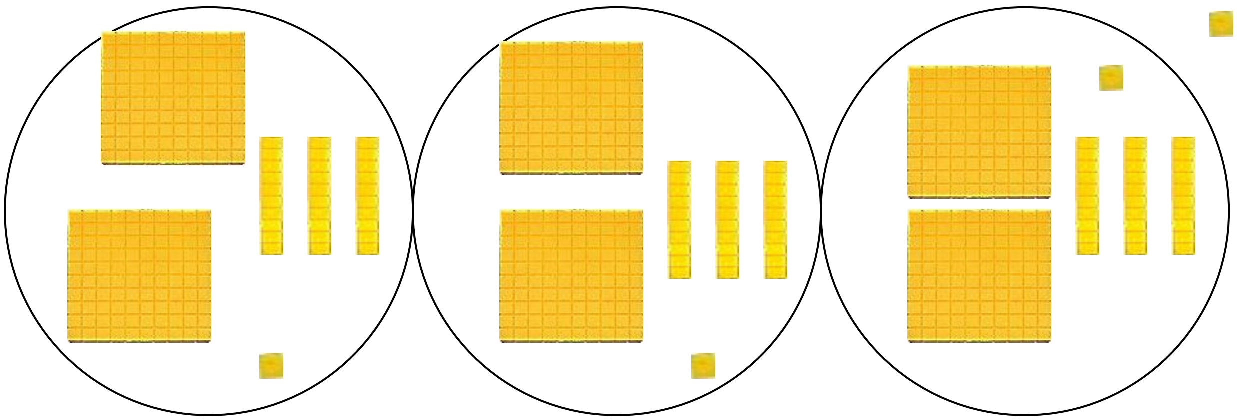
Section 3

Suggestions for helping your child find the answers
Grade 5, Worksheet I

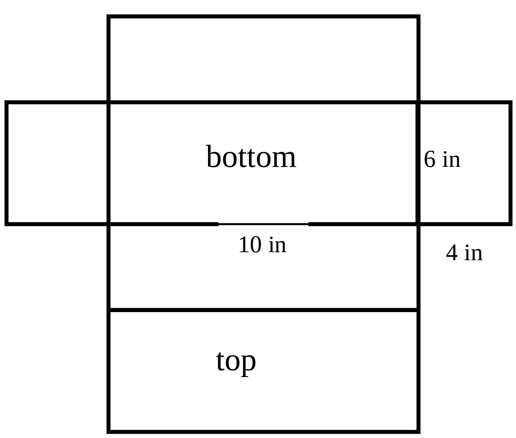
1. **Answer: See picture below.** This problem asks your child to model the concept of division. Your child should recall the base ten blocks and know how to put them into 3 groups with the same amount in each group. Have them draw or demonstrate how they got their answer. There is 1 block that can't go into a group—that's the remainder.

If you don't have base ten blocks, you can cut out pieces of paper about the same size and label the small block 1, the long shape 10, and the larger square 100.



2. **Answer: 240.** It would be best if your child would show the bottom layer of such a box, and then see that there would be 4 such layers as they made a similar layer for each inch in height. Use sugar cubes or another similar manipulative to show a 10-by-6 array for the bottom layer—that's 60 cubic inches. Then 4 such layers would be 240 cubic inches. Of course, it is best if the child generalizes this concept and just multiplies the length times the height times the width, but many children aren't ready to generalize this formula yet. They will learn that in 5th grade.

3. **Answer: 248 in^2.** If your child has trouble visualizing what *surface area* means, then cut out a net like the one below, and have the child fold it up to resemble the box. Be sure they can see the top, the bottom, and the 4 sides. They can find the area of each of those rectangles, and add them together for the *surface area.*



4. **Answer: a. ¼ + ⅓ + 1/6 = *x*   b. 9/12 (or ¾)   c. 12/12 – 9/12 = *x*   d. 3/12 or ¼** Have your child draw a circle for the pizza, and divide it into 12 pieces the same size. Have them shade in ⅓ of the circle—4 pieces—and then ¼ of the circle—3 pieces. Finally, they shade in 1/6 of the circle, or 2 pieces. That's a total of 9 pieces that have been removed, or 9/12 of the circle. Don't have your child worry about renaming the fraction as ¾, but if they do so, that's fine. The subtraction part of the problem is similar in nature, starting with the whole pizza—12/12—and removing ¾, leaving 3 pieces or ¼.

5. **Answer: 42 meters.** Be sure your child draws a "top down" view of the rectangular batting cage. Since the rectangle's dimensions are 11.75 by 9.25 meters, you can double each number to get all 4 sides. Adding 11.75, 11.75, 9.25, and 9.25 is the same as multiplying (11.75 + 9.25) by 2.

6. **Answer: 11 tiles and 13 tiles should be circled.** If possible, use some square tiles and have your child try to make rectangles using that number of tiles, for the given numbers 6, 11, 12, and 15. Use post-it notes or something similar if you don't have tiles. You child should be able to make a 1-by-6 rectangle and a 2-by-3 rectangle from six tiles. For 12 tiles, they can make a 1-by-12, a 2-by-6, and a 3-by-4 rectangle. (Notice they could make more rectangles is we agreed that an *x*-by-*y* rectangle is different than a *y*-by-*x* rectangle.) But for 11 and 13, they can only make a 1-by-11 and a 1-by-13. So 11 and 13 are *prime* numbers. This means mathematically that their only *factors* are 1 and the number itself.

7. **Answer: 4/11 and 6/13 should be circled.** This problem is a precursor to a skill your child will meet in 5th grade—finding a common denominator to add or subtract fractions. To do so with fractions that have prime numbers as denominators, they can simply multiply the denominators to get the common denominator. Don't bring this up with your child at this point—that's something they will learn in 5th grade.

Suggestions for helping your child find the answers
Grade 5, Worksheet II

1. **Answer: 14. Explanations will vary.** Your child might understand this problem by the "cover-up" method of solving equations, in which they cover up the variable with a finger and, in this case, say to themselves—*3 plus what number gives 17? Oh, I know—it's 14.*

Another way to think about the problem involves using the balance scale shown. Discuss with your child that 3 small squares are shown on the left along with a big square labeled *x*. That amount balances 17 small squares on the right pan. So if the child removes three identical small squares from both sides, the scale will stay in balance. That will leave *x* balanced with 14 small squares, so *x* = 14 grams.

2. **Answer: a. 15 minutes each b. Explanations will vary** Discuss this problem with your child, and be sure they include Lauren as a poet, giving 6 people to read over 90 minutes. If your child doesn't realize the problem calls for division, then make a number line on a strip of paper, with 90 marks for the ninety minutes. Have your child fold or partition the 90 marks into 6 even sections, and each section is how long a person gets to read. There should be 15 marks in each section.

Your child might be able to solve this problem using mental math—encourage your child to think about the numbers before they use paper-and-pencil long division. A mental math strategy could be to use facts that they know. Ten minutes per person times 6 people is 60 minutes, and five minutes per person times 6 people is 30 minutes. So 15 minutes per person times 6 people is 90 minutes, the amount of time you have.

They key to part (c) is for your child to realize that they can check a problem using the *inverse* operation, and multiplication is the inverse of division.

3. **Answers: cylinder weighs 4 pounds, cube weighs 5 pounds, sphere weighs7 pounds. Explanations will vary—some children will simply guess until they get numbers that work, and others will figure it out logically, as described below.** Encourage your child to look at all three scales, and find one that has some information they can use. In this case, but not all cases, they can find the clues by looking at the scales from left to right. If the three identical cylinders on the first scale weigh 12 pounds, then one cylinder weighs 4 pounds (12 divided by 3 = 4). If the two cylinders on the middle scale are 8 pounds (4 + 4 = 8), then the cube is the difference between 13 and 8 (13 – 8 = 5). On the third scale, we have the 4-pound cylinder and the 5 pound cube (4 + 5 = 9). The sphere's weight is the difference between 16 and 9 (16 – 9 = 7). Have your child explain how they came to their answer.

4. **Answer: a. 6 classrooms; b. 21 students in five classes and 22 in one class c. Answers will vary** Your child can use division to answer this question, and then make sense of the remainder. First they will want to divide 127 by 23--by doing so they are demonstrating how many classrooms are filled with 23 students each. See below.

$$\begin{array}{r} 5\phantom{\text{ R12}} \\ 23\overline{)127}\text{ R12} \\ \underline{-115}\phantom{\text{ R12}} \\ 12\phantom{\text{ R12}} \end{array}$$

They need to interpret the remainder, 12, as the number of students left out of the 5 classrooms with a capacity of 23 each. They need to have another classroom for these students. For part (c), it would not make sense to have 5 classrooms of 23 students and 1 classroom with only 12 students. They will need to figure out how to make each classroom similar in size. You could do this by adding and subtracting among the classrooms, or by dividing 127 students by 6 classrooms, and adjusting the size so they were "about equal." They will need to justify their answer, if their choice is to make sense.

5. **Answer: The multiples of 3 are 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, & 45. The multiples of 7 are 7, 14, 21, 28, 35, & 42 The multiples of 6 are 6, 12, 18, 24, 30, 36, & 42. The LCM of these numbers is 42.** Be sure your child understands what we mean by the *multiples* of a number—those are what you get when you multiply the number by 1, 2, 3, 4, etc., in order. Assuming the child has this concept, they can find those multiples by *skip counting* by the number. Once they have the multiples of all three numbers, the child looks for any common multiples, and then for the smallest of the common multiples.

6. **Answer: a. 2^5 means 2×2×2×2×2 and so $2^5 = 32$; b. 3^2 means 3×3 and so $3^2 = 9$; c. 3^3 means 3×3×3 and so $3^3 = 27$; d. 3^4 means 3×3×3×3 and so $3^4 = 81$.** Discuss with your child that the small numbers to the right of a regular number mean these are *exponents* and refer to how many times we multiply by the given number. Be sure your child understands that an exponent of 2 doesn't mean "multiply by 2," or an exponent of 3 doesn't mean "multiply by 3," and so forth.

Suggestions for helping your child find the answers
Grade 5, Worksheet III

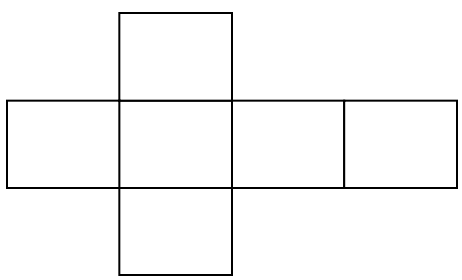
1. **Answers: a. 4 b. 45 c. 0** Go over with your child what the directions say—*do what is inside the parentheses first*. Be sure they understand that part. That is the key—the rest are simply computations with which they should be familiar.

2. **Answer: The *estimate* should be "about 10". The *accurate* answer is 10 r 23 or 10 and 23/38 or 10.6052....** Estimation with compatible numbers--numbers that are easy to compute--can be done mentally. In this case, 38 is close to 40, and 403 is close to 400, so a good estimate is 400 ÷ 40. Your child should be encouraged to think *how many 40s are there in 400. Since ten 40s is 400, there must be 10 of them. So my estimate is 10.* Having your child explain their reasoning will help you understand their logic, and it may help them recognize an error that was made.

If your child hasn't encountered long division yet, they can still get an accurate answer by repeated subtraction. They repeatedly subtract 38 from 403 and see how many times they can do that before they get a remainder less than 38. They can do it 10 times, with a remainder of 23. You might allow them to use a calculator for this computation. It should be easier to estimate an answer to this problem than to compute it.

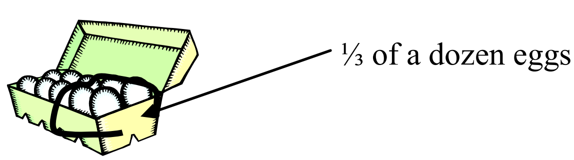
3. **Answer: 384 square inches.** The area of each side of the cube is 8 × 8 or 64 square inches. Since there are 6 sides to the figure, 64 must be multiplied by 6 to get the area of each face. 64 × 6 = 384. Or your child might add 64 six times, getting 384.

If your child has trouble understanding what the problem calls for, have them start with a *net* for a cube as shown below, and find the area of each of the 6 faces. Then they cut out the *net*, fold it up and tape the sides together to make the cube.



4. **Answers: 4, 8** To find ⅓ of a dozen eggs, the child would divide 12 eggs into three equal groups having 4 in each group. So ⅓ of 12 is 4. To find ⅔ of a dozen eggs, the child would just take two of those groups with 4 in it, giving 8 as ⅔ of 12.

If your child has difficulty understanding this notion, take a carton of eggs and have them physically divide the eggs into three equal groups, as shown below. Then finding ⅓ or ⅔ of the dozen is just taking one or two such groups, respectively.



5. **Answers: L is (4,6); M is (5,1); N is (6,3).** Be sure that your child knows what they are being asked to do—find the exact location of a point on the grid. You might tell them that people had to agree on how to name such points, and by common agreement, map makers agreed to tell how far *out* you go first, then how far *up* you go. Have them practice a few of these by telling them there's a buried treasure at certain locations, and see if they can use this system to tell you where it's buried. The first number is along the x-axis and the second is along the y-axis. It may help to say that you always have to "run" before you "jump" in order to slam dunk or do well at the long jump.

6. **Answer: HI is the word spelled out.** Be sure your child understands that, for this problem, they are to connect only the points listed *within* a, then b, then c, etc., and NOT to try and connect a to b to c to d, etc. They may be confused at first if they have solved other types of puzzles in which they connected the letters of the alphabet in order, such as drawing a picture in an alphabet puzzle book.

7. **Answer 31.95** Your child might be tempted to line up decimals starting with the right most digit, as they have done with whole numbers. When adding or subtracting numbers with decimals, however, the decimal points must be lined up vertically so that you add values that are alike – *tenths* to *tenths*, *ones* to *ones*, and so forth. Hopefully, if your child finds a different answer from their paper-and-pencil answer when trying it on a calculator, they will internalize that they have to "line up the decimal points" when adding or subtracting decimals, so all of the place values "line up".

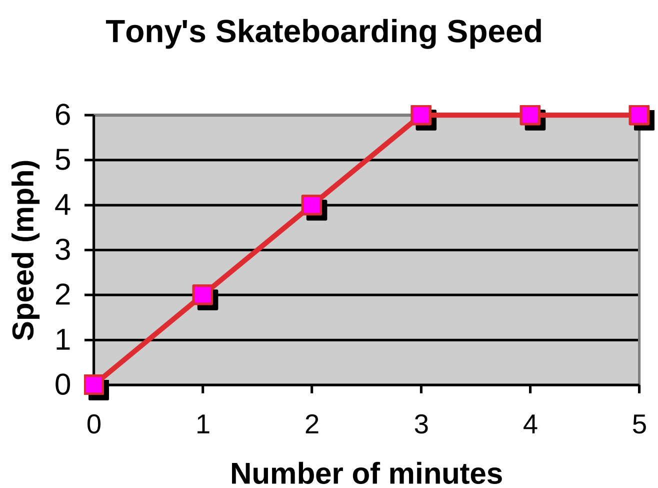
Suggestions for helping your child find the answers
Grade 5, Worksheet IV

1. **Answer**: **$^{-}\$7$.** Go through with your child what it means to have a bank account, and what it means to write a check. If you have some old checks around, have them write some checks and find the resulting balance after each one. The "Bank of Mom" statement implies that the Mother was allowing her daughter to use her Mother's bank account, and just kept the balance as a separate part of the real checking account.

Ask your child what happens if you write a check for more money than you have in the bank. Usually the bank will not cash the check, and the company that tried to cash your check will charge you a penalty. So it's never good to go "below zero" in your checking account.

Show your child a vertical number line with the numbers $^{+}1$ through $^{+}15$ above zero, and the numbers $^{-}1$ to $^{-}15$ below zero. Have your child start at $^{+}13$ to show \$13, and move down 20 spaces to show spending \$20. The answer will be where they stop, $^{-}7$.

2. **Answer: see graph below.** It is important to label the graph with a title and description of the *x* and *y* axes. Have your child explain what various points on their



graph correspond to. You might also ask what happened at the 5-minute mark—Tony's speed dropped instantly to zero.

3. **Answer: 8/12 (or 2/3), 6/12 (or ½).** Have your child draw a picture of 12 doughnuts in a box, and label that 12/12 or 1 whole box. Then they mark out four doughnuts so that eight doughnuts are left. Have your child tell you that 8/12 of the whole box is now left. So 12/12 – 4/12 is 8/12.

Have your child mark out two more doughnuts, leaving six doughnuts in the box, or 6/12 of the whole box. Point out to them that 6/12 of the box is also half the doughnuts they started with, so 6/12 = ½. (Note: In both answers, do not stress renaming the fractions in lowest terms.)

4. **Answer: Explanations will vary.** This problem can be done using mental math with multiplication. Having your child practice their multiplication facts will help them with estimation and division. If the band teacher estimated about 400 people in attendance, you need to figure out what numbers they were using to get 400. The thought process that your child may have:

> *7,836 rounded to the nearest thousand is 8,000 and 19 rounded to the nearest ten is 20. Look at the numbers 8 and 2; 8 divided by 2 is 4. Then you account for the zeros, getting 400 as your estimate.*

Estimation is a powerful tool in math and in life. Whether the newspaper printed the actual number of attendance per show, or a close estimate, the point would still be made. Sometimes estimates are more effective in communication than accurate answers.

5. **Answers may vary: About 50 – 60 miles each hour.** (Depending on how they estimated) When your child estimates, we want them to think of numbers that are compatible (easy to divide). They may think of 1200 and 20. They should notice that 20 can go into 120, six times. So 20 goes into 1200 sixty times. Sixty miles each hour could be an estimate. Another way to estimate would be to use 1000 and 20. Twenty goes into 100 five times so 20 into 1000 would be 50 miles per hour. So 60 miles per hour is a high estimate and 50 miles per hour is a low estimate. But both are acceptable in this case, as is a number between 50 and 60.

6. **Answer - $136.61.** Have your child explain to you how they set up addition and subtraction problems with decimals by lining up the decimal points. If they don't mention it, ask them why they line up the decimal points, and hope they respond with *you do that so you are adding similar place values—tenths to tenths, and hundredths to hundredths.*

7. **Answer: Equation: $24 + 4 = 7\times b$ or an equivalent equation. Solution: $b = 4$.** If your child is having trouble making an equation, have them draw a picture of 24 bag lunches, and then add 4 more bags. Ask them how many lunches that is altogether. Then attack the second part of the problem—this amount is 7 times as many lunches as Norman made. So they can partition 28 lunches into 7 groups the same size, and count the number in each group. They should get 4.

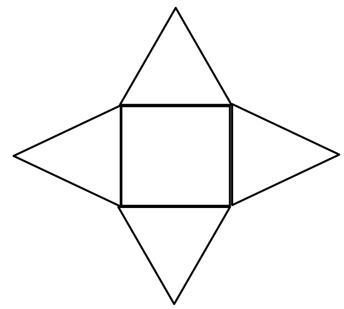
If your child writes the equation and wants to solve it mathematically, without a drawing, there are two ways they might proceed. One way is to use the "cover up" method by covering up the variable b and asking themselves—*what number, multiplied by 7, gives 4. Ah, I know—that's 4.* The other way is to remember that you can do the same thing to both sides of an equation, and keep things equal. So the child could divide both sides of **$28 = 7\times b$** by 7, to "isolate the variable." $28 \div 7 = 4$, and $7\times b \div 7 = b$. So $b = 4$.

8. **Answer: 7/12 of a year.** Have your child use the drawing and mark off ⅓ of a year on the first row, then ¼ of a year on the second row. That would be 4 months and 3 months, respectively. The total is 7 months, or 7/12 of a year. Be sure your child realizes what they have done—added two fractions with different denominators by using the common denominator 12. I.e., $\frac{1}{3} + \frac{1}{4} = 4/12 + 3/12 = 7/12$.

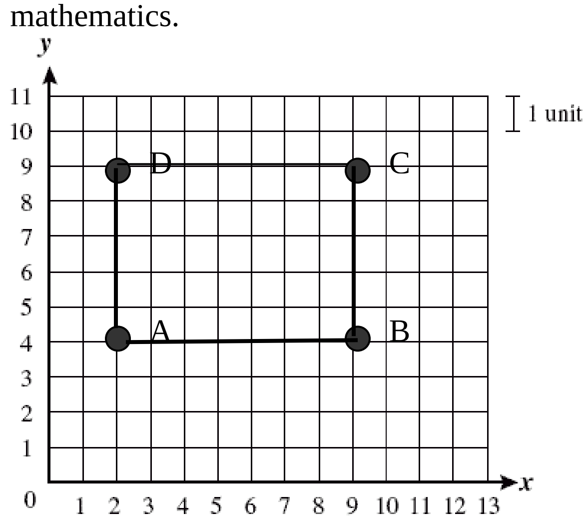
Suggestions for helping your child find the answers
Grade 5, Worksheet V

1. **Answer: a. 5 b. 8 c. 5 d. 4 right angles, 12 acute angles.** If your child is having trouble visualizing the shape, have them cut one out using the net below, fold on the lines and tape the faces to make the square pyramid.

The four *right* angles are in the square, or base of the figure. Each triangle contains 3 *acute* angles (less than 90 degrees). Since there are 4 triangles, there are 4×3 = 12 acute angles.



2. **Answers: a. rectangle b. 35 c. Explanations will vary** Lines should be drawn to connect points A, B, C and D as shown below. In finding the *area*, ask your child if they understand what that means—it's the number of squares that cover the figure. Hopefully the child will know that they can multiply the *length* of a rectangle by its *width* to find the area. If the child doesn't know this, you can have them count the squares by rows and they'll have 7 squares in each of 5 rows, and can count 7, 14, 21, 28, and 35 to find the area. It is important, however, for your child to remember that the area of a rectangle is given by the formula $A = l \times w$. This knowledge is basic for moving ahead in mathematics.



3. Answers: a. triangles b. The child should recognize that when they cut the rectangle in half with a diagonal line, the area of the resulting figure is half the area of the rectangle. c. 17½ units^2 The purpose of this problem is for the child to get a first hint that the area of a rectangle is basic knowledge, and the area of a triangle can be derived from that. I.e., since $A = l \times w$ for a rectangle, it makes sense—in this special case, anyway, that $A = ½(l \times w)$ for a triangle.

4. **Answer: 7 birds and 3 horses.** The point of this problem is for the child to learn the strategy *guess-check-revise*. In discussing the problem with your child, be sure they understand what the problem calls for—the number of birds and the number of horses where the total number of birds and horses is 10, and the total number of legs is 26. So the child can guess pairs of numbers that sum to ten, and figure out if the legs of those numbers of birds and horses totals 26. If not, they revise their guess of the two numbers that sum to ten, either getting more horses or more birds, depending on whether they need more legs or fewer legs. Many children will start and guess 5 birds and 5 horses, but that gives 10 bird legs and 20 horse legs, or 30 legs altogether. That's too many legs, so they need to increase the number of birds and decrease the number of horses. Eventually they should pick 7 birds and 3 horses.

5. **Answers: a. 900 b. 4 c. The numbers in each problem should be reversed, and turned into a multiplication problem.** In (a) and (b), help your child notice the pattern that is given. For (a), they look down the list to see the pattern; for (b), they should look up the list. The first step is to locate the basic facts within the numbers, as shown in bold below. After locating the basic facts they will notice the zeros in the numbers, and notice the pattern. The zeros cancel each other out and the leftover zeros are placed in the answer.

a.
$\mathbf{45}\underline{0} \div \mathbf{5}\underline{0} = \mathbf{9}$
$\mathbf{4{,}5}\underline{00} \div \mathbf{5}\underline{0} = \mathbf{9}\underline{0}$
$\mathbf{45}{,}\underline{000} \div \mathbf{5}\underline{0} = ?$

b.
$\mathbf{28}\underline{0} \div \mathbf{7}\underline{0} = ?$
$\mathbf{28}\underline{00} \div \mathbf{7}\underline{0} = \mathbf{4}\underline{0}$
$\mathbf{28}\underline{000} \div \mathbf{7}\underline{0} = \mathbf{4}\underline{00}$

Turning these problems into multiplication problems reminds the child of the relationship between multiplication and division as *inverse operations* that *undo* each other.

6. **Answers: Rectangular prism: C, Cube: A, Triangular prism: B, Triangular Pyramid: D. Answers on what the faces have in common will vary.** The concept of *nets* is based on taking 2 dimensional shapes and converting them to 3 dimensional solids. The key to this problem is the ability to recognize the base of each figure. All 6 sides of the cube are squares and the sides of the rectangular prism are rectangles. The base of the triangular pyramid is a triangle while the base and two sides of the triangular prism are rectangles. These designs can easily be cut out and pasted from a large sheet of paper to model this concept. (Note: a *cube* is also a *rectangular prism*, just a special type.)

One thing that all the faces have in common is that they are all flat surfaces, and they are all polygons. In discussing this with your child, point out that many 3-dimensional shapes aren't like this—a cylinder or sphere, for example. Those shapes roll because their surfaces are not flat polygons. Show them with a can from the pantry or a ball of some sort.

Suggestions for helping your child find the answers
Grade 5, Worksheet VI

1. **Answer: $2 \times (7 + 21) \div 7 = 8$** Have your child find the answer to the problem just working from left to right, which is 5. But mention to them that mathematicians agreed years ago that sometimes what they write should not be done just left to right, and so they agreed on an order in which to do computations. You might encourage them to use a sentence like **M**y **D**ear **A**unt **S**ally which brings to mind that you **m**ultiply first in an expression, then **d**ivide, then **a**dd, then **s**ubtract. However, parentheses trumps all of those—whatever is inside the parentheses must be done first, and then you follow **M**y **D**ear **A**unt **S**ally. To remember this agreement, your child might memorize *Please, My Dear Aunt Sally*.

2. **Answers: a. A check mark is between $^{-}2$ and $^{-}3$. b. Another check mark is above +2 symbol. C. 5 feet d. 1½ feet** The purpose of this problem is to introduce students to using positive and negative numbers in a natural way. Explain to your child what "sea level" means, and that numbers above sea level are called positive, and numbers below sea level are called negative. New Orleans was dealt severe damage by Hurricane Katrina because most of that city is below sea level and the water didn't have a natural way to drain in the aftermath of the storm. For problems (c) and (d), have your child put a pencil on the first number given, and move in "half foot" jumps until they reach the other number, counting as they go by half feet. Part (d) may seem strange to them—that the difference in two negative numbers is a positive number—but they need to remember that *distance* is always a positive number.

3. **Answer: $^{+}2$, 0, $^{-}1$, $^{-}3$** Have you child explain "Eric's method" to you. Then have them put their pencil tip on $^{+}2$, and go down the line until they find all the numbers.

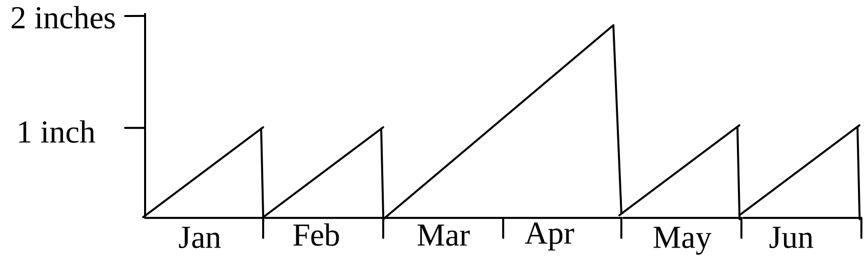
4. **Answer: 12 days.** This problem can be solved in several ways. If your child is having trouble, have them draw the problem so they can visually see what is going on.

Example:

One way to proceed: Figure out how many cards she gets in one day. With 2 packs of 8 cards each, she gets 16 cards each day. Then divide 192 cards, by 16 cards per day, and you get 12 days. Another way is to divide 192 cards by 8 cards per pack and get 24 packs she must buy. She buys 2 packs per day, and 24 packs divided by 2 packs per day gives 12 days. A third way is to add 16 cards per day till you get to 192 cards, and count the times you added 16. All three methods give the same answer so your child has a choice of ways to do this problem.

5. **Answer: See the graph below**. Have your child explain the scenario to you, and point out on the axes provided where various points should be. For example, when would

Juan's hair be 1 inch long; when would it be ½ inch; when would it be 0 inches; and when would it be 1½ inches, etc. Then your child can simply connect the points as the story proceeds, starting at the beginning of January at 0 inches long.



6. **Answer: The first graph should be circled.** In problem 5 above, the continuous line graph made sense because time and hair length are both *continuous* sets of data. (*Time* is a *continuous* quantity, and so is *hair length*.) However, in this case, the number of toys Josie sells is a *discrete* set of data. You can't sell numbers of toys between whole numbers of toys, and the only money values you could make are $1, $2, $3, and so on. You couldn't make $1.39, for example, unless you changed the conditions of the problem and allowed the toys to sell for less than $1. So the graph on the left is more accurate than the one on the right.

Talk with your child about the two graphs in this problem, and ask them about the visual difference between them. Ask them when a continuous line graph would be better than a graph that just shows individual points. Finally, ask them why a continuous graph makes sense for problem 5, but not for problem 6.

7. **Answers: a. 10   b. and c. Answers will vary.   d. The distance around your child's neck should be approximately twice the distance around their wrist**   For (a), watch as your child counts the number of spaces between centimeter marks on a ruler. Watch for the common mistake of counting the marks instead of the spaces between marks. Help them measure the distance around their necks and wrists, using either a flexible tape measure or a string that can then be placed beside a ruler. It's true that, for most people, the distance around a person's neck is about twice the distance around one of their wrists. There are many other such ratios that typify the human body, and forensic scientists use these ratios to reconstruct a skeleton from just a few bones.

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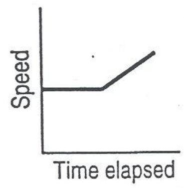
Suggestions for helping your child find the answers
Grade 5, Worksheet VII

1. **Answer: a. 12½, 15 b. January—you can tell because the two dots on the line are lower than the other dots on the line. c. The line would go down instead of up, because the daylight hours decrease from the middle of the summer until December.** Have your child study this *line graph*, and talk about what the graph is about, and what the dots mean and how the lower axis is labeled to show January 1st, January 15th, February 1st, and so on. Be sure that you child can approximate where the dots line up with numbers on the left axis. For January 1st, for example, the dot would line up with about 8 or 9, probably 8½. Be sure you discuss with them that days get longer from winter through summer, and then shorter from summer through winter, because of the position of the sun relative to earth.

2. **Answer: The left-most graph should be circled.**



For this graph, the "steady pace" is shown by the horizontal part of the *line graph* because the person's speed neither increases nor decreases. Then the line graph slopes up to show an increase in speed as the man gathers speed going down the mountain.

Have your child explain what they think the *line graphs* show, and don't be surprised if they interpret the parts of the line to be the ground the person is walking over. This means that they are not attending to what the label on the left axis means—the person's speed.

3. **Answers: a. 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, and 30 should be circled. 3, 6, 9, 12, 15, 18, 21, 24, 27, and 30 should have squares around them. b. 6, 12, 18, 24, and 30 have both circles and squares. c. *six* is the single number that circled and squared numbers are a multiple of.** This problem leads students into the use of common multiples in adding fractions, which is problem 4 below. Go over with your child what it means to find the *multiples* of a number—that means to start with the number itself as the first multiple, then to find twice that number as the second multiple, then 3 times the number is the third multiple, and so forth. So the first few *multiples for three*, for example, would be 1×3, 2×3, 3×3, 4×3, 5×3, ... Students can also find these multiples by *skip counting* through the numbers—3, 6, 9, 12, 15, and so forth.

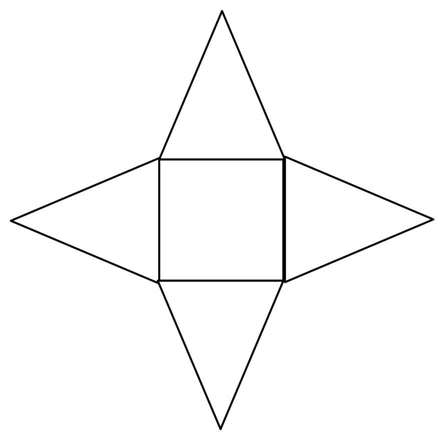
4. **Answer: 6** Have your child look back at problem 3**,** parts b and c. In part b, they find the first few multiples of both 2 and 3—the *common multiples* of these two numbers. Then in part c, they find the *least common multiple* of 2 and 3. Doing so will enable them to add two fractions with different denominators since they have to rename the fractions so they have a common denominator. The *least common denominator* is usually the "easiest" *common denominator* to pick.

5. **Answer: Your child will need to show you ½ of a six-pack, and ⅓ of a second six-pack, and then show that this total gives 5 colas, or 5/6 of a six-pack.** Have your child explain to you how to show ½ of the six-pack on the left, and ⅓ of the six-pack on the right. Then on the far right, they would show that 3 of the colas—for ½ of a six-pack—and 2 of the colas—for ⅓ of a six-pack—totals 5 colas, or 5/6 of the six-pack on the right. A completed sketch might look like the one below:

½ of a 6-pack + ⅓ of a 6-pack is 5 colas, or 5/6 of a 6-pack

6. **Answer: 5 faces, 5 vertices, and 8 edges.** Some students may have difficulty with the vocabulary. You can clarify by explaining that the faces are the visible surfaces or "sides" of a solid object. This pyramid is made up of a square and four triangles. The vertices are the "corners" of the pyramid, where the lines meet. There are four vertices at the base of the pyramid—the square—and one vertex at the top where the triangles meet. The edges are the lines separating each face from another face.

If your child is having trouble visualizing this shape, have them cut out a "net" for the pyramid as shown to the right. They then fold up the four triangles and tape them together to show the square pyramid.



7. **Answer: 12 boats** Your child will probably realize that dividing 139 by 12 will give the answer. If they don't realize this, then have them take 139 counters of some sort—pennies, paper clips, or something similar—and start removing them in groups of 12. Each group would represent 1 boatload. After 11 such groups, they will have 132 people into boats, but 7 people are left. So those 7 will need another boat.

8. **Answer: $^{-}8^{\circ}$.** Have your child draw a vertical number line, the way it would appear on a thermometer. Locate a point in the middle and label it "zero", with the numbers above zero being the positive numbers 1, 2, 3, ... Have your child label the numbers below zero using negative numbers: $^{-}1$, $^{-}2$, $^{-}3$, and so forth. Then your child puts his or her finger on $^{-}3$, and goes down the thermometer five more numbers, winding up at $^{-}8$.

Suggestions for helping your child find the answers
Grade 5, Worksheet VIII

1. **Answer: Answers will vary.** Ask your child what "8*p"* represents, and give them the hint that "8*p*" is just a shortcut for writing "8 × *p*". This stands for the price of 8 pencils. Since Maxine got $3.16 back as change, that means that the price of the pencils plus $3.16, is $5. So the equation shows that situation.

2. **Answer: *p* = 23¢ or $0.23. The answer for how to solve the equation will vary.** There are basically two ways to solve this equation—one way is by *guess-check-revise.* A child would simply guess the value of a pencil, and revise their guess up or down, after trying their guess in the equation. For example, if each pencil cost $0.20, then 8 would cost $1.60, but $1.60 + $3.16 = $4.76, not $5. So 20¢ isn't enough for the cost of a pencil, and they can guess a higher amount.

The second and preferred way to solve the equation is by using the *principle of equality* that says you can subtract the same amount from both sides of an equation, and it will stay in balance. So you can subtract $3.16 from both sides of the equation and have 8*p* + $3.16 – $3.16 = $5.00 – $3.16, so 8*p* = $1.84. Applying another *principle of equality*—that you can divide both sides by the same number, and retain equality—means that you can say that 8*p* ÷ 8 = $1.84 ÷ 8 = $0.23. Since 8*p* ÷ 8 = *p*, we know *p* = 23¢.

3. **Answer: 8 centimeters.** Since you're subtracting 148.2 – 140.2 mentally, you should see that only the ones place is changing from a 0 to an 8. The difference is therefore 8 cm. You might reinforce other ways to write these measures in your discussion. Another way to write 148.2 centimeters, for example, is 1 meter, 48 centimeters, and 2 millimeters.

4. **Answer: 2.3ºF.** Ask your child if they know why they need to line up the decimal points when adding or subtracting—it's so that you will add or subtract *tenths* and *tenths*, and so forth. If they have trouble visualizing this problem, draw a vertical number line that starts at 98º and goes up to 100º, with the tenths marked off between whole number degrees. Have your child move their finger to correspond to the action of the problem. Mathematically, you can start with 100.1. Add 1.1 and get 101.2. Since it went from 101.2 to 98.9, your child must find the difference between those numbers, or subtract. Or, they might simply move their finger down the number line and count how far they moved it.

5. **Answer: It would be full.** Have your child take a drawing of a buck and mark it into four equal sections, each being ¼ of the whole bucket. Have them shade in each section as each girl pours hers in, and when the bucket is full after the fourth girl, ask what will happen when the next girl pours. Mathematically, **t**he child may add ¼ + ¼ + ¼ + ¼ + ¼ to get 5/4. They may realize that 4/4 is full, and you have more to add, so the bucket would overflow by ¼ of its size.

6. **Answer: 2 feet.** Ask your child if 14¾ is closer to 14 or to 15—have them show you on a number line that it's closer to 15. Then do the same with 12⅔, which is closer to 13. The difference in 15 and 13 is 2, the answer to the problem.

7. **Answer: Beth; 1/6** If your child doesn't know how to proceed, have them take two groups of six counters each to represent the six problems that each student has to do. Then for Jake's group, they divide the counters into three equal groups for ⅓, and take two of them to show ⅔ of six—that's 4 counters out of 6. To show Beth's, the counters are already divided into sixths, so they can show 5 of the counters for 5/6. Then Beth's 5 counters are more than Jake's 4 counters, so Beth has done more problems. One more problem, to be exact, since 5 is 1 more than 4. So Beth has done 1/6 more of the homework than Jake.

8. **Answer: 4** Your child can simply *guess-check-revise* to find this answer. They can start with any single digit and try it out, to see if they wind up with that same digit at the end. If not, they can try another one. Four is the number that works since $4 \times 3 = 12$; $12 + 8 = 20$; $20 \div 2 = 10$; and $10 - 6 = 4$.

Suggestions for helping your child find the answers
Grade 5, Worksheet IX

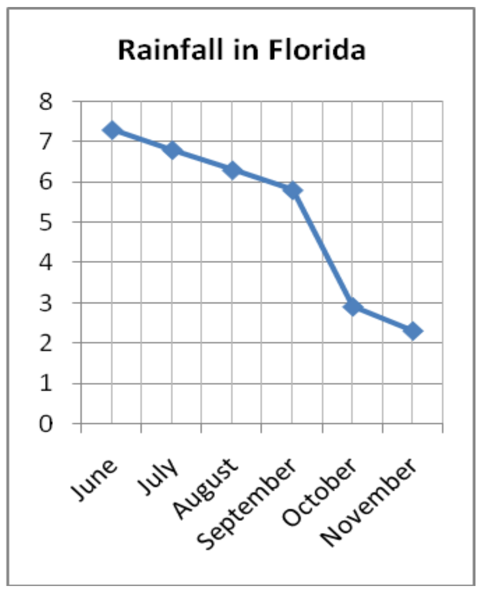
1. **Answer: 56 tickets**. Your child should know that they have to divide, due to what the problem is asking. You are given how much each ticket is and an amount of the money. Your child needs to find out how many tickets they can buy with the amount of money he was given. This requires your child to use their knowledge and skills in dividing multi-digit whole numbers. This can be done a few ways depending what strategy your child feels most comfortable with. Here is an example done with long division.

Long Division: standard method they need to know when dividing.

```
       56
    ______
45 ) 2520        Place value comes into play with long division
    -225↓
      270
    - 270
        0
```

Another way to do the problem is to add 46 enough times to get 2540, perhaps in chunks. For example, ten 46s is 460, so 20 is 920, and 40 is 1840. That's getting close to 2520, and can be done by hand from there on.

2. **Answer: See the graph below; June and November**



Help your child decide where the middle of each month is, and how high to go on the graph to show the rainfall. Then they connect each dot with the next dot. Discuss with them what it means when a line graph goes down over time, as this one does—it means there is less rainfall heading from summer to winter.

The biggest difference in rainfall is between June and November. You might ask your child in which months next to each other, the rainfall difference was the greatest. Those months are September and October because the line takes the greatest dip there.

3. **Answer: 3¼ miles.** Have your child use a ruler to show 1½ inches + 1¾ inches lined up end-to-end. Pretend that each inch is a mile. The end of the journey on a ruler should be 3¼ inches. Some children will solve this mentally, by taking ½ away from ¾, and

combining that ½ with 1½, to give 2. Then they "add on" 1¼ that's left, to the 2, getting 3¼ that way.
4. **Answer: a. $22 b. No, it's not enough as you need at least $22. c. $22.20** Your child should have no trouble rounding each amount to the nearest dollar. If they do have trouble, have them show each amount with real money and talk about what is the closest whole dollar amount to each item. Ask your child why they must line up the decimal points when adding or subtracting—it's so they'll add *tenths* to *tenths,* and *hundredths* to *hundredths.* Or your child might say—so you'll add dimes to dimes, and pennies to pennies.

5. **Answer: The circled numbers are 5, 7, 23, and 2.** The only factors of 5 are 1 and 5; the factors of 7 are 1 and 7; the factors of 23 are 1 and 23; and the factors of 2 are 1 and 2. But 14 has the factors 1 and 14, but also 2 and 7; 21 has factors 1 and 21, but also 3 and 7; 45 has factors 1 and 45, but also 5, 9, 3, and 15; 9 has factors 1 and 9, but also 3 is a factor; and 39 has factors 1 and 39, but also 3 and 13 are factors of 39.

6. **Answer: 45 = 3×3×5 and 36 = 2×2×3×3** There are two different factor trees that the child could make for 45—see below. They could start with 9×5 or 3×15 as numbers that equal 45 when multiplied together. Prime numbers should be circled and composite numbers—those numbers that have more than 2 factors—get another "branch" to continue factoring. Both diagrams below show that 3, and 5 are the three prime factors of 45. Your child can check by multiplying 3×3×5 = 45 on a calculator.

For 36, your child could start in several ways because 2×18 = 36; 3×12 = 36; 4×9 = 36, and 6×6 = 36. The beauty of prime factorization is that, no matter how you start, you reach the same prime factors in the end, except possibly for the order in which you list them.

7. **Answer: 45 = 3^2×5; 36 = 2^2×3^2** You might want to go back to worksheet II with your child, and have them review what an *exponent* means. It's simply a short way to express when a number is multiplied by itself several times. *Exponents* are quite useful in the sciences, and particularly in expressing large numbers like the distance from the earth to the sun as 94,000,000 miles. Scientists would probably write this number as 9.4×10^7 miles. *Exponents* are quite useful in algebra, coming up in your child's future years.

Suggestions for helping your child find the answers
Grade 5, Worksheet X

1. **Answer: 3/6 or 1/2 of a cup.** Have your child draw a picture of a cup and mark it going up the side into *thirds* and again into *sixths*. Your child should see that 1/3 lines up with 2/6, and 2/3 lines up with 4/6. Mark the brother's amount—the $\frac{1}{3}$ of a cup. That is the same as having 2/6. If he has 2/6, he needs 3/6 more to equal your 5/6. Don't worry if your child doesn't rename the fraction 3/6 to $\frac{1}{2}$, as that's a skill that they'll learn later.

2. **Answer: 28 miles.** Since the problem doesn't specify "how close" to round the numbers, your child could round each mixed number to the nearest mile. For any fractional distance your child is unfamiliar with, have them draw a line segment to represent 1 whole mile, then partition it into the number of pieces in the denominator, and shade the number of those segments in the numerator. Is their shading closer to the left or to the right end of the whole line segment?

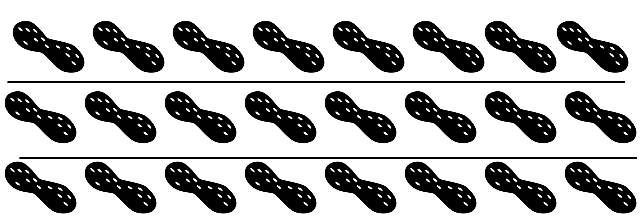
$8\frac{2}{3}$ is closer to 9 than to 8, so use 9. $7\frac{1}{4}$ is closer to 7 than to 8; $5\frac{7}{8}$ is closer to 6 than to 5; and $6\frac{1}{4}$ is closer to 6 than to 7. 9 + 7 + 6 + 6 = 28.

3. **Answer: 6 hours 360 minutes Seconds** Have your child count hours from 8:40 to 9:40, to 10:40, and so on to 2:40. That's 6 hours. There are 60 minutes in an hour. Six hours times 60 minutes is 360 minutes. *Seconds* is a more precise unit of measurement because seconds are smaller and more exact than minutes or hours. Generally, a smaller unit of measure is more precise than a larger one, but sometimes gives a number that is too large for many people to grasp the true meaning. (In this case, a school day is 21,600 seconds long.)

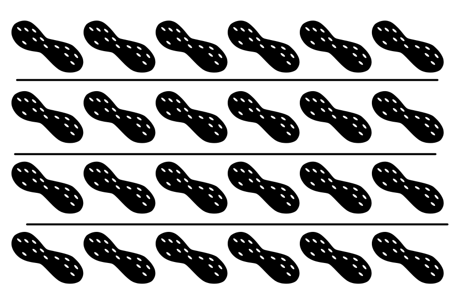
4. **Answer: Jasper ate 16, Alice ate 18, and there were 14 peanuts left in both bags together.** Be sure your child understands what the problem calls for. The first part asks for how many peanuts each person ate—the second part asks how many peanuts, in both bags together, were left.

Suggest that your child draw a diagram to show an understanding of the concept. Have them show 24 peanuts in each of two bags. In Jasper's bag, they divide the peanuts into 3 equal groups, and take two of those groups, and count to find 16 peanuts he ate. In Alice's bag, divide the peanuts into four equal groups, and show three of the four. Counting the nuts in those three groups gives 18 peanuts.

Both bags together held 24 + 24 or 48 nuts, and 16 + 18 = 34 nuts were eaten. That leaves 14 uneaten peanuts altogether.



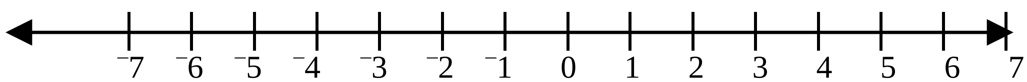
Jasper's bag



Alice's bag

5. **Answer: 79 feet and 948 inches.** Have your child tell you how many feet are in a yard and how many inches are in a foot. If the hint isn't enough, perhaps your have a ruler and a yardstick handy and your child can use these tools to show you what they mean. Ask your child to show you how many feet would be in ⅓ yard, and to show you that amount with the yardstick. To convert the yards to feet, your child would multiply: $26 \times 3 = 78$ and add on another foot for ⅓ of a yard, giving 79 feet. To convert feet to inches, your child would multiply again: $79 \times 12 = 948$.

6. **Answer: -4, -3, -2, -1, 0, 1, 2, 4, 5. The 5 would be circled.** A correct number line would look like this, although your child might show only the numbers from $^{-}4$ to 5:



Have your child return to problems 2 and 3 on Worksheet VI to determine which numbers are bigger than other numbers. The only difference between this number line and the one on the previous worksheet is that this one is horizontal, and the one for Worksheet VI was vertical. Hopefully your child will say that the numbers get bigger as you move to the right, on a horizontal number line.

7. **Answer: 10 cm and $\frac{1}{10}$ of a meter.** As your child uses a centimeter ruler, make sure he or she starts measuring the line segment at zero. Ask them how they can remember how many centimeters are in a meter. Expect them to say that *cent* means 1/100, as in *1 cent* is *1/100 of a dollar*. So there are 100 centimeters in a meter. If there are 10 cm, the fraction would be $\frac{10}{100}$ of a meter **(**which is the same as $\frac{1}{10}$ meter). Either fraction is acceptable.

8. **Answer: 88** Your child can solve this riddle by *guess-check-revise*. But first, they can eliminate some numbers using clues. They also might not know what is meant by a *square number* and a *cube number*. If that is the case, then go over with them that a *square number* is a number multiplied by itself, and a *cube* is a number multiplied by itself three times.

The first and third lines tell you the number is two of the same digit—either 11, 22, 33, 44, 55, 66, 77, 88, or 99. The second line eliminates the odd numbers, so you're left with 22, 44, 66, and 88 as possible answers. If you multiply the digits in 22, then 44, then 66, and then 88 respectively, you get 4, 16, 36, and 64. So *guess* each possibility in turn, and *check* it against the conditions of being both a *square* and a *cube* when the digits are multiplied. Your child will find out that 64 is the only number of the four that is both a square ($64 = 8^2$) and a cube ($64 = 4^3$). So the answer to the problem is 88.

Thank You!