# Chapter 1 – Formulas and Whole Numbers

**Introduction:** Formulas are a part of life. There are formulas which banks use to calculate interest and interest rates. There are formulas in science, statistics, finance and geometry. Formulas help us make important calculations and understand the world around us.

Look at the example $A = P\left(1 + r/n\right)^{nt}$ . This is a formula which banks use to calculate how much money will be projected to be in a CD (certificate of deposit) after t number of years. If we plugged in numbers into this formula, would you be able to calculate the future value amount? A large part of algebra and statistics revolves around the study and use of formulas. Using formulas correctly is the focus of the first half of our book and a recurrent theme throughout the class.

## Section 1A – Formulas with Adding and Subtracting Whole Numbers

Look at the following formula. The first formula (P = L + W + L + W) is one we use to calculate the perimeter of a rectangle. "L" represents the length and "W" represents the width of the rectangle. For example could you calculate how many feet of fencing we will need to fence a horse pasture that is 345 feet by 461 feet? Plugging into the formula we get the following 345 + 461 + 345 + 461, but can you work this out and actually get the correct answer? A recurrent problem in science, algebra and statistics classes is that students can plug into a formula, but cannot get the correct answer due to poor arithmetic skills. In my experience of teaching, most students who fail my algebra class cannot add, subtract multiply or divide the numbers correctly in order to get the correct answer. Hence we need to practice our arithmetic.

In this section we are looking at reviewing adding and subtracting and the concepts of carrying and borrowing. Review your addition and subtraction facts. You should be able to add numbers like 8+9 and 7+5 quickly. You should also be able to subtract 13-8 and 17-11 quickly.

Example: Add the following: 368 + 79. Remember, we need to line up the place values. 368 means 300 + 60 + 8 and 79 means 70 + 9. Adding the correct place values is critical. Whenever we go over 10 in a place value we carry (re-group) to the next place value. 8+9 = 17 = 10+7 so we put the 7 and carry 1 ten to the tens place. Adding 1+6+7 = 14 tens = 1 hundred + 4 tens, so we put the 4 in the tens place and carry the 1 to the hundreds place. 1+3 = 4 hundreds. So our answer is 447.

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$$\begin{array}{r} 368 \\ +79 \\ \hline 447 \end{array}$$

Do the following examples with your instructor. Pay close attention to carrying correctly.

Example 1 : 354 + 87

Example 2 : 5749 + 2883

Example 3: Now see if you can calculate the perimeter of a rectangular field that is 345 ft by 451 ft using the formula L+W+L+W.

Subtract the following: 513 – 268 . Remember 513 means 500 + 10 + 3. We want to take away 200, take away 60 and take away 8. Problem is how do you subtract 8 from 3 or 60 from 10? The answer is borrowing and regrouping. Any time you borrow, you can add 10 to the next place value. For example if I borrow 1 hundred, I can add 10 tens to the tens place. Borrowing 1 ten, allows us to add 10 ones to the ones place. So 500 + 10 +3 becomes 400 + 100 +13. Now we subtract. 13-8 = 5. 10 tens – 6 tens = 4 tens = 40. 4 hundreds – 2 hundred = 2 hundreds. So the answer is 245.

$$\begin{array}{r} 513 \\ -268 \\ \hline 245 \end{array}$$

Subtract the following 3000 – 1386. Subtracting from numbers with a lot of zeros can be a particular challenge. An easy way to do this is to think of 3000 as 300 tens. If we borrow 1 ten from 300, we are left with 299 tens. We can now add 10 to the ones place and subtract.

$$\begin{array}{r} 2\,9\,9\,10 \\ \cancel{3}\,\cancel{0}\,\cancel{0}\,\cancel{0} \\ -1\;3\,8\,6 \\ \hline 1\;6\,1\,4 \end{array}$$

Do the following examples with your instructor. Pay close attention to borrowing correctly.

Example 4: 5012 – 895

Example 5: 8000 – 1362

**Practice Problems Section 1A**

Perform the indicated operation for #1-42.

| | | |
|---|---|---|
| 1. 29 + 41 | 2. 16 + 39 | 3. 78 + 44 |
| 4. 671 + 9 | 5. 302 + 58 | 6. 77 + 125 |
| 7. 358 + 412 | 8. 47 + 183 | 9. 138 + 216 |
| 10. 4671 + 399 | 11. 387 + 417 | 12. 985 + 977 |
| 13. 379 + 948 | 14. 579 + 321 + 851 | 15. 73 + 24 + 59 + 31 |
| 16. 997 + 842 | 17. 49 + 38 + 87 | 18. 68,994 + 47,872 |
| 19. 6,752 + 796 | 20. 387 + 4,529 | 21. 945 + 967 + 899 |
| 22. 568 + 47,648 | 23. 785 + 721 + 357 | 24. 95 + 29 + 56 + 33 |
| 25. 897 – 342 | 26. 682 – 384 | 27. 1,523 – 964 |
| 28. 2301 – 1298 | 29. 13,572 – 8,614 | 30. 5,621 – 3,814 |
| 31. 700 – 246 | 32. 3,000 – 875 | 33. 40,000 – 12,796 |
| 34. 703 – 447 | 35. 612 – 184 | 36. 1,431 – 675 |
| 37. 2101 – 1493 | 38. 20,135 – 8,769 | 39. 3,721 – 873 |
| 40. 400 – 273 | 41. 7,000 – 1,536 | 42. 30,000 – 9,714 |

43. Profit = revenue (R) – costs (C). If a company has a revenue of $12,003 this month and their costs were $3,862 , what is their profit?

44. Profit = revenue (R) – costs (C). If a company has a revenue of $85,000 this month and their costs were $24,300 , what is their profit?

45. Let's use the perimeter formula from earlier P = L + W + L + W to calculate how many feet of crown molding we must purchase for a room that is 21 feet by 15 feet?

46. Let's use the perimeter formula from earlier P = L + W + L + W to calculate how many meters of fencing we must purchase to go around a rectangular area that is 472 meters by 326 meters.

47. Two of the tallest buildings in NY are the Empire State building and the Chrysler building. The Empire State building is 1454 feet tall, while the Chrysler building is 1046 feet tall. What is the difference between the heights of these two famous buildings?

48. The Eiffel Tower in Paris, France is 1063 feet tall. The Statue of Liberty in NY, USA is 305 feet tall. How much taller is the Eiffel Tower than the Statue of Liberty?

49. Jeremy works as a Taxi driver. On Monday, he made $148. On Tuesday he made $207. On Wednesday he made $264. How much total money did he make for the 3 days of work?

50. Leah sells jewelry at a booth in the mall. On Friday she sold $729 worth of jewelry. On Saturday she sold $1032 and on Sunday she sold $561. Find her total sales for the three day period.

51. Elena has $2574 in her checking account. Elena paid her $1045 rent and her $376 car payment. How much money is now left in her checking account?

52. Tyler has $873 in his checking account. His work paid him $1379 which he deposited in his account. He then paid his water bill of $87 and his electric bill of $147. How much money does he have left in his checking account?

## Section 1B – Formulas with Multiplying Whole Numbers and Positive Exponents

A common formula in geometry classes is the volume of a box (rectangular prism). The volume formula is $V = L \times W \times H$ . If we knew the length width and height of the box, could we calculate the volume? Again, many students miss this problem due to poor arithmetic skills. So let's review multiplication and positive exponents so we can make our Geometry teachers happy.

Remember multiplication is repeat addition. If I have 17 buses each with 45 students in each of them, then I have 45 + 45 +45 + … (17 times). An easy way to figure this out is to multiply 45 x 17 = 765 total students.

Note: It is very advisable to review your multiplication tables. Flashcards work well. There are also games you can play online that review multiplication facts. Either way, being proficient in your multiplication tables is important if you want to do well in your algebra classes.

Let's start by reviewing multiplication by one and zero. Recall that any number times 1 is itself. So 53 x 1 = 53 and 1 x 728 = 728. Also recall that any number times zero is zero. So 37 x 0 = 0 and 0 x 74 = 0.

Next let's review multiplying numbers with lots of zeros. There is an easy shortcut to this. Multiply the non-zero numbers and then add on all the zeros. For example let's look at 12000 x 400. Start with 12 x 4 = 48. We have an additional five zeros so the answer is 4,800,000.

Multiplication can be on the complicated side due to partial products. Let's look at 36 x 52 for example. Many students think that multiplication works like addition and we simply multiply the place values. That is an extremely wrong idea. 36 x 52 is really (30+6)(50+2) = (30x50)+(30x2) + (6x50) + (6x2). These are called partial products. So the answer is 1500 + 60 + 300 + 12 = 1872. Common algorithms for multiplication can also multiply (2x36) + (50x36) and then add.

<u>Do the following examples with your instructor. Pay close attention to the partial products</u>.

Example 1: 230 x 1,000

Example 2: 5,000 x 71,000

Example 3 : 57 x 78

Example 4: 23 x 496

Many formulas involve exponents. Remember an exponent tells you how many times you should multiply the base times itself. $7^4$ means 7 x 7 x 7 x 7 (multiply four 7's). So $7^4 = 2401$.

Do the following examples with your instructor. Pay close attention. Which number is the base and which is the exponent?

Example 5: Simplify $8^2$

Example 6: Simplify $3^4$

Note: In formulas involving both exponents and multiplication, we should do the exponents before the multiplication.

**Practice Problems Section 1B**

Perform the indicated operation for #1-48.

| | | |
|---|---|---|
| 1. 4 x 13 | 2. 52 x 8 | 3. 14 x 19 |
| 4. 300 x 60 | 5. 240 x 1,000 | 6. 5,000 x 1,400 |
| 7. 24 x 79 | 8. 51 x 64 | 9. 31 x 569 |
| 10. 120 x 45,000 | 11. 135 x 892 | 12. 206 x 784 |
| 13. 26 x 4,018 | 14. 164 x 37 | 15. 71 x 928 |
| 16. 30,000 x 19,000 | 17. 400 x 132,000 | 18. 734 x 906 |
| 19. 7 x 12 x 18 | 20. 56 x 4 x 10 | 21. 29 x 135 |
| 22. 1,700 x 50 | 23. 3600 x 1,000 | 24. 72,000 x 300 |
| 25. 301 x 506 | 26. 624 x 207 | 27. 8 x 2005 |

28. 120 x 0
29. 1 x 934
30. 267 x 0
31. 574 x 1
32. 0 x 75
33. 1 x 9,734
34. 40,000 x 13,000
35. 600 x 108,000
36. 31,000 x 4,000
37. $9^2$
38. $5^3$
39. $6^2$
40. $6^3$
41. $2^5$
42. $3^4$
43. $13^2$
44. $11^3$
45. $25^2$
46. $1^6$
47. $0^4$
48. $8^2 \times 3$
49. $7 \times 2^4$
50. $7^2 \times 3$
51. $3^2 \times 5 \times 4$
52. $11 \times 3^3$
53. $5^3 \times 17$
54. $16^2 \times 10 \times 8$

55. The perimeter of a square is given by the formula $P = 4 \times s$ , where *s* is the length of one of the sides of the square. What is the perimeter of a square window where the length of a side is 24 inches?

56. The perimeter of a square is given by the formula $P = 4 \times s$ , where *s* is the length of one of the sides of the square. What is the perimeter of a square external hard-drive for a computer where the length of a side is 27 mm?

57. The perimeter of a square is given by the formula $P = 4 \times s$ , where *s* is the length of one of the sides of the square. What is the perimeter of a square shaped garden where the length of a side is 113 feet?

58. Use the volume of a box formula $V = L \times W \times H$ to calculate the volume of a box that is 4 feet by 6 feet by 13 feet.

59. Use the volume of a box formula $V = L \times W \times H$ to calculate the volume of a box that is 12 in by 8 in by 15 in.

60. Use the volume of a box formula $V = L \times W \times H$ to calculate the volume of a box that is 23 cm by 16 cm by 100 cm.

61. The volume of a cube is given by the formula $V = s^3$ where *s* is the length of a side of the cube. Calculate the volume of a cube that has a side that is 8 mm long.

62. The volume of a cube is given by the formula $V = s^3$ where *s* is the length of a side of the cube. Calculate the volume of a cube that has a side that is 20 inches long.

63. Leah started a savings account. Every month $145 will be deposited in her account. How much total money will she have deposited after 6 months?

64. Brian rents a room for $575 per month. If he paid the rent for 8 months, how much total rent would he have paid?

65. The standard deviation in a data set is 26 pounds. How much is three standard deviations?

66. The standard deviation in a data set is 17 inches. How far is four standard deviations?

## Section 1C – Formulas with Division

A common formula in Statistics is to calculate a z-score. The formula is given by $z = \frac{(x-\mu)}{\sigma}$.

Many students have problems getting the correct z-score because they have trouble with division.

Two common applications of division is repeat subtraction and breaking a total into groups. For example Jimmy has $3000 in his account. How many times can he pay his rent of $400 before he runs out of money? Notice he is repeatedly subtracting the quantity $400. This is division. Remember the total should always come first in the division. So we can find the answer by dividing: $3000 \div 400$ = 7 remainder of 200. So he can pay his rent 7 times. After paying 7 times he will only have $200 in his account and will not be able to pay his rent.

Here is another example. Suppose a company has manufactured 13,600 paper bags. The bags are to be sent to five different supermarkets with each market getting an equal number of bags. How many bags were sent to each market? This is also division. Make sure to put the total first in the division. Dividing we get $13600 \div 5$ = 2,720. So each market will get 2,720 bags.

Let's look at a few special division problems involving zero and one. First of all, any number divided by 1 is the same as the number itself. For example, let's look at $53 \div 1$. This is asking how many times we can subtract 1 from 53. The answer is of course 53 times. Note, be careful of the order of division. $53 \div 1 \neq 1 \div 53$. The 1 has to be the number you are dividing by (divisor). $1 \div 53$ can be written as a fraction or decimal. It is <u>not</u> 53!

Any number divided by itself is equal to 1. For example, let's look at $\frac{37}{37}$. This is asking how many times you can subtract 37 from 37. The answer is of course 1 time.

You have to be careful with division problems involving zero. Zero divided by any non-zero number is equal to zero. For example, let's look at $0 \div 19$. This is asking what number we can multiply by 19 and get an answer of 0. $(19 \times ? = 0)$. The answer of course is zero.

Be careful though. A non-zero number divided by zero is undefined (does not exist). For example, let's look at $13 \div 0$. This is asking what number we can multiply by 0 and get an answer of 13. $(0 \times ? = 13)$. This is impossible! Remember any number times 0 is 0. It is impossible to get an answer of 13. That is why we say that a number divided by zero is undefined.

Do the following examples with your instructor. You can use the usual algorithm or the repeated subtraction approach. Leave your answer as quotient and remainder.

Example 1: $77 \div 1$

Example 2: $\frac{0}{24}$

Example 3: $28 \div 0$

Example 4: $\frac{56}{56}$

If you struggle with the standard algorithm of long division, then the repeat subtraction approach may work well for you. Here is how it works. Look at the bag problem. We were trying to figure out $13600 \div 5$. What we are asking is how many times can we subtract 5 from 13600? Take a guess. Say 1000 times. If we subtract 5x1000 we are left with 8600. Subtract 5 another 1000 times. We would be left with 3600. Keep guessing and subtracting. When you can't subtract a 5 anymore you are done. Just keep track of how many times you subtracted 5. In the end, add up all the times you subtracted 5. The better your guesses get the fewer times you have to subtract.

13600
−5000 (5 subtracted 1000 times)
8600
−5000 (5 subtracted 1000 times)
3600
−2000 (5 subtracted 400 times)
1600
−1000 (5 subtracted 200 times)
600
−500 (5 subtracted 100 times)
100
−100 (5 subtracted 20 times)
0

total number of times subtracted = 2720 with zero remainder

Do the following examples with your instructor. You can use the usual algorithm or the repeated subtraction approach. Leave your answer as quotient and remainder.

Example 5: $252 \div 7$

Example 6: $\frac{6312}{42}$

**Practice Problems Section IC**

Divide the following using either repeated subtraction or the usual algorithm. You can leave your answer as quotient and remainder.

1. $17 \div 1$
2. $21 \div 0$
3. $0 \div 4$
4. $\frac{0}{6}$
5. $\frac{13}{0}$
6. $\frac{245}{1}$
7. $\frac{2,635}{1}$
8. $375 \div 0$
9. $\frac{64}{64}$
10. $17 \div 17$
11. $0 \div 16$
12. $33 \div 0$
13. $\frac{20}{0}$
14. $\frac{0}{12}$
15. $\frac{382}{1}$
16. $\frac{85}{85}$
17. $0 \div 26$
18. $\frac{527}{1}$
19. $35 \div 3$
20. $99 \div 12$
21. $76 \div 10$
22. $17 \div 6$
23. $73 \div 9$
24. $92 \div 11$
25. $50 \div 13$
26. $133 \div 7$
27. $748 \div 4$
28. $96 \div 12$
29. $420 \div 6$
30. $300 \div 18$
31. $83 \div 5$
32. $724 \div 8$
33. $4,000 \div 15$

34. $564 \div 9$

35. $5,000 \div 13$

36. $7461 \div 20$

37. $368 \div 12$

38. $6,000 \div 17$

39. $4,813 \div 25$

40. $\frac{3450}{82}$

41. $\frac{1256}{28}$

42. $\frac{40,000}{300}$

43. $\frac{2481}{42}$

44. $\frac{2546}{19}$

45. $\frac{20,007}{130}$

46. $h = \frac{2A}{b}$ is a formula in geometry that can be used to calculate the height *(h)* of a triangle if we know the area *(A)* and the base *(b)*. A sail boat has a sail that has an area of 120 square feet. If the base is 6 feet, what is the height of the sail?

47. $h = \frac{2A}{b}$ is a formula in geometry that can be used to calculate the height *(h)* of a triangle if we know the area *(A)* and the base *(b)*. Another boat sail has an area of 170 square feet and a base of 20 feet. What is the height of the sail?

48. Jerome needs to save $10,080 to buy a car. If he can save $420 per month, how many months will it take him to reach his goal?

49. Mia has $5160 in her checking account. Her monthly rent is $890. If she does not deposit any money into the account, how many months can she pay her rent before the money runs out?

50. Jed is saving up to buy a guitar. The guitar he wants is $2470. He makes $330 per week at his work. If he saves his entire weekly paychecks, how many weeks will he have to work to afford the guitar?

51. Trianna's loves to buy candy at the corner store before school each morning. Her mom gave her $19 for candy. The candy she loves the best costs $2. How many days can she buy her favorite candy before she runs out of money. Will she have any money left over?

52. Let's look at the statistics formula for z-score we looked at in the beginning of this section $z = \frac{(x-\mu)}{\sigma}$. Because the subtraction is in a parenthesis, we need to do this first. Find the z-score if $x = 23, \mu = 17, \sigma = 6$ . A z-score larger than two is considered unusual. Is this an unusual z-score?

53. Let's look at the statistics formula for z-score we looked at in the beginning of this section $z = \frac{(x-\mu)}{\sigma}$. Because the subtraction is in a parenthesis, we need to do this first. Find the z-score if $x = 55, \mu = 27, \sigma = 4$ . A z-score larger than two is considered unusual. Is this an unusual z-score?

54. Let's look at the statistics formula for z-score we looked at in the beginning of this section $z = \frac{(x-\mu)}{\sigma}$. Because the subtraction is in a parenthesis, we need to do this first. Find the z-score if $x = 237, \mu = 141, \sigma = 32$ . A z-score larger than two is considered unusual. Is this an unusual z-score?

55. Let's look at the statistics formula for z-score we looked at in the beginning of this section $z = \frac{(x-\mu)}{\sigma}$. Because the subtraction is in a parenthesis, we need to do this first. Find the z-score if $x = 143, \mu = 101, \sigma = 14$ . A z-score larger than two is considered unusual. Is this an unusual z-score?

## Section 1D – Formulas with Square Roots and Order of Operations

A common formula in algebra is the distance between two points.

$$d = \sqrt{\left[ \left( x_2 - x_1 \right)^2 + \left( y_2 - y_1 \right)^2 \right]}$$

This formula gives many students problems as it involves different operations that must be done in a particular order. The different letters and parentheses can be confusing as well. We see that to make sense of a formula like this, we need to not only review square roots, but also review the order of operations.

A square root is a number we can square that gives us the number that is under the square root. For example, $\sqrt{49}$ means what number can we square (multiply by itself) to get 49? The answer is 7 of course, since $7^2 = 7 \times 7 = 49$ .

Do the following examples with your instructor.

Example 1: $\sqrt{25}$ Example 2: $\sqrt{169}$

The order of operations is the order we perform calculations. If you do a problem out of order, you will often get the wrong answer. Here is the order of operations. It is vital to memorize these!

Order of Operations

1. Parenthesis $( \ )[ \ ]\{ \ \}$
2. Exponents and Square Roots
3. Multiplication and Division in order from left to right.
4. Addition and Subtraction in order from left to right.

For example, lets look at $89 - (13+17) \div 6 \times 2^3$ . We do parenthesis first, so 13 + 17 is 30. We now do exponents, so $2^3 = 2 \times 2 \times 2$ =8. So now we have 89 – (30) ÷ 6 x 8. Multiplication and division in order from left to right is next. Notice a division came first so we do the division before the multiplication. 30 divided by 6 is 5. Now 5 x 8 = 40. So we are left with 89-40 = 49.

Now do the following examples with your instructor. Pay close attention to doing the problems in the correct order.

Example 3: Simplify $24 \div \sqrt{144} + (23-14)^2$

Example 4: Simplify $3\left[7 \times (5+1) \div \sqrt{4}\right]$

**Practice Problems Section 1D**

Perform the indicated operation for #1-29.

1. $\sqrt{1}$
2. $\sqrt{0}$
3. $\sqrt{16}$
4. $\sqrt{4}$
5. $\sqrt{49}$
6. $\sqrt{64}$
7. $\sqrt{25}$
8. $\sqrt{9}$
9. $\sqrt{100}$
10. $\sqrt{81}$
11. $\sqrt{121}$
12. $\sqrt{196}$
13. $\sqrt{400}$
14. $\sqrt{225}$
15. $\sqrt{144}$
16. $\sqrt{8100}$
17. $\sqrt{900}$
18. $\sqrt{169}$
19. $\sqrt{2500}$
20. $\sqrt{1600}$
21. $\sqrt{4900}$

22. $71 - 3 \times 13$
23. $48 + 60 \div 12$
24. $99 - 24 \div 6 \times 11$
25. $6 \times \sqrt{4} + 7^2$
26. $21 + 36 \div 3 \times 5 - 18$
27. $69 - 5 \times \sqrt{9} + 10^2$
28. $48 - 36 \times 4 \div 3^2$
29. $79 - 15 + 4^2 \times \sqrt{81}$
30. $7(14 + 2 \times 3 - 19)^3$
31. $56 + 4 \times 18 \div 9 - (3 + \sqrt{4})^2$

32. $55+(23-17)\times 6+4^3$

33. $54\div\sqrt{81}+(13-7)^2$

34. $4\left[44\div(5-1)\times\sqrt{100}\right]$

35. $\dfrac{\left[4\times(18-13)^2\right]}{\sqrt{(15-11)}}$

Remember the z-score formula in statistics. Here is a tougher z-score formula that many statistics students struggle with. Let's see if you can calculate it. Remember to use the order of operations. $z=\dfrac{(\overline{x}-\mu)}{(\sigma\div\sqrt{n})}$

36. Find the z-score when $\overline{x}=51$, $\mu=46$, $\sigma=6$ and $n=9$.

37. Find the z-score when $\overline{x}=25$, $\mu=17$, $\sigma=32$ and $n=16$.

38. Find the z-score when $\overline{x}=139$, $\mu=121$, $\sigma=12$ and $n=4$.

39. Find the z-score when $\overline{x}=2596$, $\mu=2500$, $\sigma=120$ and $n=25$.

Now let's see if we are ready to tackle the distance formula: $d=\sqrt{\left[(x_2-x_1)^2+(y_2-y_1)^2\right]}$

40. Find the distance if $x_1=5$, $x_2=13$, $y_1=10$, and $y_2=16$

41. Find the distance if $x_1=6$, $x_2=10$, $y_1=11$, and $y_2=14$

42. Find the distance if $x_1=3$, $x_2=8$, $y_1=2$, and $y_2=14$

43. Find the distance if $x_1=17$, $x_2=26$, $y_1=13$, and $y_2=25$

## Chapter 1 Review

In Module I, we saw that formulas are used all the time in school and in everyday life. In order to evaluate a formula though, we have to be confident in our arithmetic skills. We reviewed addition, subtraction, multiplication, division, exponents, square roots, and order of operations, but more importantly, we used them to tackle real formulas.

**Chapter 1 Review Problems**

Perform the indicated operation for #1-46.

1. 23 + 14 + 57
2. 156 + 198 + 377
3. 478 + 969
4. 8961 + 4530
5. 875 + 641
6. 905 + 728
7. 200 – 87
8. 3000 – 1472
9. 1500 – 851
10. 531 – 175
11. 1348 – 936
12. 4421 – 3897
13. 6 x 18
14. 7 x 42
15. 300 x 40
16. 130 x 500
17. 1200 x 8000
18. 740 x 10000
19. 65 x 73
20. 84 x 89
21. 24 x 148
22. 75 x 348
23. 135 x 642
24. 307 x 52
25. 16 x 0
26. 14 x 1
27. 1 x 234
28. 0 x 138
29. $145 \div 3$
30. $650 \div 26$
31. $144 \div 9$
32. $1356 \div 89$
33. $13 \div 1$
34. $0 \div 56$
35. $\frac{5}{1}$
36. $\frac{16}{0}$
37. $\frac{45}{4}$
38. $\frac{103}{103}$
39. $\frac{57}{57}$
40. $\frac{38}{1}$
41. $\frac{18700}{340}$
42. $5^2$
43. $14^2$
44. $3^5$
45. $\sqrt{16}$
46. $\sqrt{81}$
47. $\sqrt{121}$
48. $\sqrt{25}$
49. $\sqrt{900}$
50. $91 - 48 \div 8 \times 13 + 3^2$
51. $\left(17 - 11 + 4^2\right) \div 11$
52. $89 - \left(45 \div 3^2 \times 2\right) + \sqrt{36}$
53. $\sqrt{(32 + 2^3 - 4)}$

54. Jubal went on a diet to lose weight. Before the diet, he weighed 247 pounds. After the diet he weighed 183 pounds. How much weight did he lose?

55. Aria went to the store to purchase some items. The items cost $13, $8, $2, $19, and $28. What is the total cost of all the items?

56. Kira is an elementary school teacher. She is taking her class on a field-trip to a museum. She has 38 students in her class. Many parents volunteered to drive. If each car holds 3 students, how many cars will Kira need to get all of the students to the museum?

57. Leann works at a department store and gets paid $461 each week. If she works 23 weeks, how much money will she have made?

The surface area of a box is given by the formula $S = 2LW + 2LH + 2WH$ .

58. Find the surface area of a box if *L = 13cm, W = 8 cm, and H = 5 cm.*

59. Find the surface area of a box if *L = 24 in, W = 16 in, and H = 12 in.*

Let's look at the z-score formula again. $z = \dfrac{(x - \mu)}{\sigma}$

60. Find the z-score if $x = 62,\ \mu = 56,\ \text{and}\ \sigma = 3$ .

61. Find the z-score if $x = 241,\ \mu = 109,\ \text{and}\ \sigma = 12$ .

Let's look at the distance formula used in Algebra classes. $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

62. Find the distance if $x_1 = 7,\ x_2 = 16,\ y_1 = 3,\ \text{and}\ y_2 = 15$ .

63. Find the distance if $x_1 = 20,\ x_2 = 25,\ y_1 = 14,\ \text{and}\ y_2 = 26$ .