Compass

Math Study Guide

The only purpose of this study guide is to give you an overview of the type of math skills needed to successfully complete the Compass math assessment. The Study Guide is not intended to adequately prepare you for the Compass Test.

Fractions

Adding Fractions:

- You need a common denominator (bottom number).
  - Think of a number that can be divided equally by both of the old denominators. NOTE: If you can't think of one, you can always multiply the old denominators to come up with a new "common" denominator.
  - Divide the old denominator into the new denominator, multiply your answer by the old numerator.

Example: 2/4 = 6/12
+ 1/3 = 4/12

Mixed numbers are OK

Example: 4 1/3 + 16 1/2 =
4 2/6 + 16 3/6 = 20 5/6

1. 3/8 + 1/8 =
2. 1/4 + 1/16 =
3. 1/4 + 2/5 =
4. 3 2/3 + 4 2/3 =
5. 10 1/2 + 3 6/7 =
6. 6 1/5 + 3 1/4 =
7. Jack spent 1/3 of an hour on the phone in the morning and 1/2 of an hour on the phone in the afternoon. How much time did he spend on the phone altogether?
8. Sandi walked 2 1/4 miles on Monday, 3 miles on Wednesday, and 2 1/2 miles on Thursday. How many total miles did Sandi walk?

Subtracting Fractions:

- You need a common denominator (see above).

Example: 2/4 = 6/12
- 1/3 = 4/12

- Mixed numbers are OK.

Example: 16 1/2 – 4 1/3 =
16 3/6 – 4 2/6 =

- You may need to borrow from the whole number.
  8 1/6 – 4 5/6 =

  Borrow 1 from your whole number "8" and add it as a fraction 6/6 to 1/6

  7 7/6 – 4 5/6 =
  (6/6 + 1/6 = 7/6)

1. 4/7 – 1/7 =
2. 1/3 – 1/4 =
3. 7/10 – 1/2 =
4. 4 2/3 – 2 1/3 =
5. 6 2/5 – 3 1/4 =
6. 7 1/3 – 4 ¾ =
7. Mark lives 7 1/2 miles from school. Al lives 7 1/8 miles from school. Al lives how much closer to school than Mark?
8. Greg is 5 6/7 feet tall. His brother, Sam, is 5 3/4 feet tall. How much taller is Greg?

Multiplying Fractions:

- No common denominator is needed.

  Example: 1/2 x 1/4 = 1/8

- Changed mixed numbers to improper fractions.

  Example: 2 2/3 x 1/4 =
  8/3 x 1/4 =

- Multiple numbers straight across.

  Example: 8/3 x 1/4 = 8/12 = 2/3

  (reduce to lowest terms)

1. 3/4 x 5/8 =

2. 1/7 x 2/5 =

3. 5 1/3 x 3 3/4 =

4. 6 1/4 x 2 2/5 =

- When your numbers are large CANCEL OUT

Example: $\frac{\cancel{16}^{2}}{\cancel{8}_{4}} \times \frac{\cancel{2}^{1}}{\cancel{8}_{1}} = \frac{2}{4} = \frac{1}{2}$

5. 12/20 x 4/6 =

6. 4 1/2 x 8 1/4 =

7. Mary mailed four packages. Each weighed 7 1/2 pounds. What was the total weight of the four packages?

8. Harold needs 2/3 majority of the vote to be elected sheriff. If 1200 people vote, how many votes does he need to be elected?

Dividing Fractions:

- No common denominator is needed.
- Flip the second fraction and multiply.
  1/2 ÷ 1/4 =
  1/2 x 4/1 = 4/2 = 2
- Change mixed numbers to improper fractions.
  Example: 3 3/4 ÷ 9/10 =
- Multiple the whole number by the denominator (bottom number) and add it to the numerator (top number)
  15/4 ÷ 9/10 =
  (3 x 4 = 12 + 3 = 15)

1. 7/6 ÷ 2/3 =

2. 3/8 ÷ 5/16 =

3. 3 3/4 ÷ 5/8 =

4. 5 1/4 ÷ 3 1/2 =

5. Cindy and Cathy plan to split 1 2/3 pounds of chocolate. How much will each get?

6. The distance from Boston to New York City is 222 miles. If a driving trip took 4 1/2 hours, what was the average speed per hour?

7. If 15 3/4 pounds of grass seed was used to seed five acres, how much seed was used per acre?

8. Gilligan's ordered a box of steaks weighing 480 ounces. If the average steak weighs 7 1/2 ounces, how many steaks were in the box?

Reducing Fractions:

- If both of the last digits are EVEN – divide by 2
- If both of the last digits are ZERO or 5 – divide by 5
- If one of the last digits is ODD – try dividing by 3
- Can the larger number be divided by the smaller?
- Prime numbers can only be divided by themselves and 1
  Example: 1,2,3,5,7,11,13,19,29,31)
  Example: $4/8 = \frac{4 \div 4}{8 \div 4} = \frac{1}{2}$

$$10/14 = \frac{10 \div 2}{14 \div 2} = \frac{5}{7}$$

Reducing Improper Fractions:

- Divide the denominator (bottom number) into the numerator to get a whole number.
- Whatever is left over is the new numerator.
  Example: 7/2 = 3 1/2
  (7 ÷ 2 = 3, 3 x 2 = 6, 7 – 6 = 1)

Decimals

Adding Decimals:

- Line up your decimal points.
- Bring the decimal point straight down and add.
  Example: 9.4
  + 2.8
  12.2

1. 24.465 ÷ 127.77 =
2. 1.056 + 0.07875 =
3. Deb sent her son to the store for three items. They cost $.85, $1.06, and $.35. How much did he spend?
4. Tom earns $197.25 a week as a word processor. He makes $15.75 in overtime. What is his week's earnings?

Subtracting Decimals:

- Line up your decimal points.
- Bring the decimal point straight down and subtract.
  Example: 9.4
  - 2.8
  6.6

1. .624 - .578 =
2. 365.24 - 78.0897
3. Find the difference between .0031 and .010?
4. A CD player selling for $125.00 is on sale for $89.99. If Sue purchases the player at the sale price, how much does she save?

Multiplying Decimals:

- Multiply the numbers.
- Count how many numbers are to the right of the decimal point.
  Example: 4.25 x 8.3 =
  (There are three numbers to the right of the decimal point.)
- Starting at the far right of the answer, count over the number of places and place your decimal point in that space.
  Example: 4.25 x 8.3 =
  (425 x 83 = 35275)
  Move decimal point three places to the left.
  4.25 x 8.3 = 35.275

1. 3.05 x .004 =

2. 62.8 x .0009 =

3. 4 x .03 =

4. Joyce has a Christmas savings plan. She saves $10.25 a week for 50 weeks. If she completes her plan, how much will she save?

5. Carla worked 46 hours this week (40 regular hours and 6 overtime hours). Her hourly rate is $7.50 and her overtime rate is $11.25. What is Carla's gross pay for the week?

Dividing Decimals:

- If there is no decimal in the divisor (the number outside the box), move the decimal in the dividend (the number in the box) straight up into the answer area.

  Example: $5\overline{)2.5}$ .5

  If there is a decimal in the divisor, move the decimal point in the dividend to the right as many places as you moved it in the divisor.

  Example: $.25\overline{).225}$

  Place the decimal point in the answer straight up from the location in the dividend.

  Example: $25.\overline{)22.5}$ .9

1. 26.112 ÷ 8 =
2. 12.8095 ÷ 6.85 =
3. A gas station pumped 675.25 gallons of gas in 2.5 hours. How much gas was pumped in an hour?
4. A developer divided 11.25 acres of land into .25-acre lots. How many lots did he make?

Converting Fractions, Decimals, and Percents

Changing Decimals to Percents (%):

- Move the decimal two places to the right and add the percent sign.

  Example: .25 = 25%

Changing a Percent to a Decimal:

- Move the decimal two places to the left and remove the percent sign (%).

  Example: 25% = .25

Change a Fraction to a Decimal:

- Divide the numerator (top number) by the denominator (bottom number).

  Example: $1/4 = 4\overline{)1.00} = .25$

Change a Fraction to a Percent:

- Convert fraction to a decimal (see above example).
- Move the decimal point two places to the right and add a percent sign (%).
- Example: $2/5 = 5\overline{)2.00} = .4 = 40\%$

Change a Decimal to a Fraction:

- Determine the place value of the last number in the decimal.
  Example: .0 = tenths
  .00 = hundredths
  .000 = thousandths
  .0000 = ten thousandths

- Write the place as the denominator (bottom number).
  Example: $.125 = \frac{\quad}{1000}$
- Write your decimal without the decimal point as your numerator (top number).
  Example: $.123 = \frac{123}{1000}$

Change a Percent to a Fraction:

- Change your percent to a decimal (see above).
- Change decimal to a fraction (see above).
  Example: 40% = .4 = 4/10 = 2/5

1. Fill in the empty boxes.

Decimal	Fraction	Percent (%)
.25		
	5/8	
		50%
	2/3	
.45		
		30%
	1/5	
.75		

Percents

- Percent problems are made up of four elements:
- The WHOLE is the number value after the word Of.
- The PART is listed before or just after the word IS.
- The PERCENT always has a percent sign (%).
- All percents are based on 100.
- The PERCENT of the WHOLE is the PART.

Solving for Part:

- Identify the parts.
- Place the known information on a grid.
- Multiply the diagonals.
- Divide the answer by the number that is left.
  Example: What is 30% of 770.

Part	Percent
?	30
Whole	100
770	100

770 x 30 = 23100
23100 ÷ 100 = 231
Answer: 30% of 770 is 231

Solving for Part:

1. What is .5% of 300?
2. 65% of 240 is what?
3. 32% of the vote has been counted. If 775 people voted, how many votes have been counted so far?
4. Kim bought a desk for $55.00. After she refinished it, she sold it at 250% of its original price. What did she sell it for?
5. 38% of the families in the neighborhood are against having a gas station nearby. If there are 200 families in the area, how many are against having a gas station?

Solving for Percent:

- Identify the parts.
- Place the known information on a grid.
- Multiply the diagonals.
- Divide the answer by the number that is left.
- Add the percent sign.

Example: 13 is what % of 25

Part	Percent
13	?
Whole	100
25	100

13 x 100 = 1300
1300 ÷ 25 = 52
Answer: 13 is 52% of 25

Solving for Percent:

1. 62 is what percent of 124?
2. 83 is what % of 332?

3. Out of the 51 questions on the test, Tom answered 34 correctly. What percent of the total is that?

4. Sue pays $14.40 a month in union dues. She earns $1800 a month. What percent of this monthly pay goes to union dues?

5. The Johnson's paid $2320 in property tax on their $160,000 home. What % is their tax rate?

Solving for the Whole:

- Identify the parts.
- Place the known information on a grid.
- Multiply the diagonals.
- Divide the answer by the number that is left.
  Example: 50% of what is 290.

Part	Percent
290	50
Whole	100
?	100

290 x 100 = 29000
29000 ÷ 50 = 580
Answer: 50% of 580 is 290

Solving for Whole:

1. 175% of what is 770?

2. 844 is 80% of what?

3. Max paid $42 tax on the furniture he bought. If the sales tax was 7%, what was the cost of the furniture?

4. To buy a house, the Smiths need a down payment of 20%. They have saved $25,000. What is the most the Smiths can pay for a house?

5. Joyce received a $6.75 tip. It was 15% of the cost of the meal. What was the cost of the meal?

Ratios

- Relating part of an amount to the whole or another part.

  Example: You have a basket of 20 balls: 9 white and 11 red.
  What is the ratio of white balls to the red balls? $\frac{9}{11}$ (white balls / red balls)

Proportion

- A statement comparing two ratios.

  Example: 1 is to 2 as 8 is to 16
  $\frac{1}{2} = \frac{8}{16}$

Solving for the Unknown in Proportions:

$\frac{3}{4} = \frac{N}{16}$

- N is the missing number.
- Find the cross product of the numbers you know (multiply diagonally).

  Example: $3 \times 16 = 48$
  $4 \times N = 4N$
  $48 = 4N$

- Divide each side by the number that is with the unknown (N).
  $48 \div 4 = 12$
  $4N \div 4 = N$
  Answer: $N = 12$

Find the Unknown:

1. $\frac{5}{7} = \frac{N}{105}$

2. $\frac{17}{N} = \frac{21}{63}$

3. Nicole is a beautician. She takes care of 9 customers in 5 hours. What is the ratio of customers to hours?

4. Jan earns $2.00 in commissions for every $5.00 in business. If she brings in $325.00, how much money will she get in commissions?

5. A town wants to keep its ration of 7 parks to 5,000 people. If the town grows to 15,000 people, how many parks will it need?

6. If a plane flew 932 miles in 2 hours, how far will it fly in 7 hours?

Solving Equations

- Get the unknown on one side of the = sign and its value on the other side of the sign.
- Use the opposite operation (-,+,x,÷) of the one shown in the equation.
- Any operation (-,+,x,÷) performed on one side of the equation must be performed on the other side of the equation.
- The opposite of – is +, and the opposite of x is ÷.

Example: $x + 15 = 31$

$\underline{\quad - 15} \quad \underline{-15}$

$x \quad = 16$

Example: $5x = 15$ $\qquad \frac{5x}{5} = \frac{15}{5}$ $\qquad (5x \div 5 = x)$ $\qquad (15 \div 5 = x)$

$x = 3$

1. $x + 5 = 20$

2. $4N = 27$

3. $2x + 2.5 = 8.5$

4. $\frac{x}{4} - 8 = 1$

5. A light blue paint is made by mixing 2 parts of blue paint to 7 parts of white paint. Using a proportion, determine how many pints of blue paint (N) should be mixed with 28 pints of white paint to make this light blue color.

6. Northwest reduced its round-trip ticket from Boston to Washington by $62. The sale price was $169.95. What was the original price?

7. Amy and Kay sold a total of 560 cosmetic kits. Amy sold 6 times as many kits as Kay. How many did each sell?

Key Words in Word Problems:

Addition:	Total Together Whole	Sum Both	Increase Altogether
Subtraction:	Difference How much less How much is left	Remainder How much more Decreased by	
Multiplication:	Product Apiece	Times	Of
Division:	Quotient Equally	Average How many times	Shared

Signed Numbers

Adding Signed Numbers:

- Add all the positive numbers, make the total positive.
- Add all the negative numbers, make the total negative.
- Compare the two totals by subtracting the smaller from the larger, and give the answer the sign of the larger total.

Examples: Add

1. 3, -5, +12 and -9
   positive total +3, +12 = +15
   negative total -5 -9 = -14
   Comparison +15 -14 = +1 or simply 1

2. (-9) + (10) + (-8) + (+4)
   positive total (+10) + (+4) = +14
   negative total (-9) + (-8) = -17
   Comparison +14 -17 = -3

1. (+5) + (-8) + (+9) =

2. -18 + (-2) +6 =

3. 6 + (-8) =

4. (-9) + (-4) + (8) + (7) + (-2) =

5. Find the sum of: +8, -6, -5

6. Simply: -10 + (-13) + (-26)

Subtracting Signed Numbers:

- Change the sign of the number being subtracted to the opposite sign.
- Follow the rules for adding signed numbers.

Examples: Subtract

1. (+8) – (-3)

   +8 + (+3)
   +11

2. (+6) – (-4) + (-2) – (+5)

   +6 + (+4) + (-2) + (-5)
   +10 -7 = +3

1. (+6) – (+4)
2. (-8) – (+3)
3. (+8) – (7)
4. (-9) – (-9)
5. (-9) – (+4) – (+10)
6. (-3) + (-4) – (+5) – (-6)

Multiplying Signed Numbers:

- If the signs of the numbers are alike, the answer is positive.
- If the signs of the numbers are different, the answer is negative.

Example: Multiple.

(-8) (-7)

56

Since the signs are alike, the answer is positive.
signs

-3 ● 10

-30

The dot between the numbers is a symbol for multiplication. Since the

are different, the answer is negative.

- An even number of – signs gives a positive number.
- An odd number of – signs gives a negative number.

(-6) (+2) (-3) (+4) even number of – signs, answer will be positive.
(-2) (-11) (+3) (-5) odd numbers of – signs, answer will be negative.

1. (-2) 9 =
2. (+5) (-9) =
3. (-3/4) (12) =
4. -8 ● +6 ● -2 =
5. (+14) (-2) =
6. (-8) (-1) (+5) (-3)

Dividing Signed Numbers:

- If the signs of the numbers being divided are alike, the answer is positive.
- If the signs of the numbers being divided are different, the answer is negative.

Examples: Divide

$+30 \div -6$	$\frac{-28}{-12}$
-5	$+2\ 1/3$
Since the signs are different the answer is negative	Remember the fraction bar implies division since the signs are alike, the answer is positive.

1. $\frac{-40}{-20}$

2. $(-12) \div (+6)$

3. $\frac{-15}{+5}$

4. $\frac{+16}{-24}$

5. $\frac{-8}{-1}$

6. $\frac{72}{-9}$

EXPONENETS AND MONOMIALS

Exponents:

The formula for finding a volume of a prism is v = lwh. A cube is a prism that has equal dimensions. Let s represent the length of each edge. So, the formula for the volume of a cube is v = s x s x s or $v = s^3$ (pronounced s cubed). The 3 in the expression s^3 is called the exponent. The s is called the base. The exponent indicates the number of times the base is listed as a factor.

When no exponent is used, as in A = lw, the exponent of each variable is understood to be 1. If an expression contains factors that are repeated, you can rewrite the expression using exponents.

Remember y x y, y ● y, and (y) (y) all mean multiply.

Example: $5 \times 5 = 5^2$ $s \bullet s \bullet s \bullet s = s^4$

1. $x^2 \bullet x^5$
2. (y) (y)
3. (a) (a) (a)
4. (3) (3) (3) (3)
5. A cube has edges 5 inches long. What is its volume?
6. Write r ● r ● r ● r using an exponent.

Multiplying Monomials:

When like bases are multiplied the exponents are added. When monomials have coefficients other than 1, remember to multiply coefficients.

Examples: Multiply

1. $s \bullet s = s^1 \bullet s^1$
   $= s^2$

2. $(3m^2)\ (3m^2)$
   $3m^2 \bullet 3m^2 = (3 \bullet 3)\ m^2 + m^2$
   $= 9m^4$

3. $(d^3ef)(de^4) = d^{3+1} \bullet e^{1+4}$
   $= d^4e^5f$

1. $x^2 \bullet x^{-5} =$

2. $x^6 \bullet x^{-3} =$

3. $(a^3x)(a^{-1}x^2) =$

4. $x^2 \bullet x^{-2} =$

5. $(d^3)(d^{-7})(d) =$

5. $(a^4bc)(a^{-1}b^{-2}) =$

Dividing Monomials:

Division is the reverse of multiplication. When monomials are multiplied, exponents of like bases are added. When monomials are divided, exponents of like bases are subtracted. When monomials have coefficients other than 1, remember to divide the coefficients.

Recall that expression such as 5/5 and a/a equal 1. If you use the rule for dividing monomials, you see that a/a = a; therefore, any base raised to the zero power equals one.

Examples: Divide

1. a^7/a^4
   $a^{7-4} = a^3$

2. b^3/b
   $b^{3-1} = b^2$

3. $\frac{3c^2}{c^2}$
   $3c^{2-2} = 3c^0 = 3 \bullet 1 = 3$

1. $\frac{a^7}{a^{-2}}$

2. $\frac{2d^6}{d^4}$

3. $\frac{a^5}{a^3}$

4. $\frac{a^2b^{-5}}{a^{-2}b^{-5}}$

5. $\frac{xy^2z^5}{x^3y^3z}$

6. $\frac{x^{-2}y^8z^3}{x^{-3}y^{-2}z^{-3}}$

ORDER OF OPERATIONS

Order of Operations:

To evaluate an expression, the following must be followed:

- Evaluate numbers with exponents.
- Perform multiplication and division in order from left to right.
- Perform additions and subtractions in order from left to right.

This can be more simply written as:

1) Exponents
2) Multiplication and division
3) Additions and subtractions

Example: Evaluate: $3 + 2 \bullet 6$

1)	Evaluate exponents	1)	$3 + 2 \bullet 6$ (no exponents)
2)	Evaluate multiplications and divisions	2)	$3 + 12$
3)	Evaluate additions and subtractions	3)	15

Example: Evaluate: $4 + 3 \bullet 2^3 - 2 \bullet 3^2$

1)	Evaluate exponents	1)	$4 + 3 \bullet 8 - 2 \bullet 9$
2)	Evaluate multiplications and divisions	2)	$4 + 24 - 18$
3)	Evaluate additions and subtractions	3)	10

1.	$40 - 2 \bullet 5$	2.	$40 \div 2 + 5$
3.	$3 \bullet 6^2$	4.	$8 \bullet 3 - 2^2 \bullet 4$
5.	$8 \bullet 2 \div 4 - 8 \bullet 2 \div 4^2$	6.	$100 - 2^2 \bullet 5$

Parentheses to Change the Order of Operations:

One of the main uses of parentheses in math is to change the order in which operations are performed.

- Evaluate operations inside the parentheses first.

Example: Evaluate: $3 + 2 \bullet (4 + 5)$

1)	Evaluate parentheses	1)	$3 + 2 \bullet 9$
2)	Evaluate order of operations	2)	$3 + 18 = 21$

Example: Evaluate: $(3 + 4)(3 + 2 \bullet 4)$

1)	Evaluate parentheses	1)	$(3 + 4)(3 + 8)$
2)	Evaluate order of operation	2)	$7 \bullet 11 = 77$

1.	$3(4 - 2)$	2.	$(8 + 2)(9 - 3)$
3.	$4(4 \bullet 4 - 4)$	4.	$9 \bullet 3 + (6 + 2 \bullet 5)^2$
5.	$3(2 - 5)$	6.	$(3 + 4^2)(5^2 - 3^2)$

Math Study Guide Answer Key

Fractions

Adding

1. 4/8 = **1/2**
2. 4/16 + 1/16 = **5/16**
3. 5/20 + 8/20 = **13/20**
4. 3 + 4 = 7
   2/3 + 2/3 = 4/3 = 1 1/3
   7 + 1 1/3 = **8 1/3**
5. 10 + 3 = 13
   7/14 + 12/14 = 19/14 = 1 5/14
   13 + 1 5/14 = **14 5/14**
6. 6 + 3 = 9
   4/20 + 5/20 = 9/20
   9 + 9/20 = **9 9/20**
7. 1/3 + 1/2 = 2/6 + 3/6 = **5/6**
8. 2 1/4 + 3 + 2 1/2
   2 + 3 + 2 = 7
   1/4 + 1/2 = 2/8 + 4/8 = 6/8 = 3/4
   7 + 3/4 = **7 3/4**

Subtracting

1. **3/7**
2. 4/12 – 3/12 = **1/12**
3. 7/10 – 5/10 = 2/10 = **1/5**
4. 4 – 2 = 2
   2/3 – 1/3 = 1/3
   2 1/3
5. 6 – 3 = 3
   8/20 – 5/20 = 3/20
   3 3/20
6. 7 – 4 = 3
   4/12 – 9/12 (need to borrow from whole)
   6 - 4 = 2
   16/12 – 9/12 = 7/12
   2 7/12
7. 7 1/2 – 7 1/8 = 7 8/16 – 7 2/16 = 6/16 = **3/8**
8. 5 6/7 – 5 3/4
   5 – 5 = 0
   24/28 – 21/28 = 3/28
   3/28

Multiplying

1. **15/32**
2. **2/35**
3. 16/3 x 15/4 = 4/1 x 5/1 = **20**
4. 25/4 x 12/5 = 5/1 x 3/1 = **15**
5. 12/20 x 4/6 = 2/5 x 1/1 = **2/5**
6. 9/2 x 33/4 = 297/8 = **37 1/8**
7. 7 1/4 x 4 = 15/2 x 4/1 = 15/1 x 2/1 = **30**
8. 2/3 x 1200 = 2/3 x 1200/1 = 2/1 x 400/1 = **800**

Dividing

1. 7/6 x 3/2 = 7/2 x 1/2 = 7/4 = **1 3/4**
2. 3/8 x 16/5 = 3/1 x 2/5 = 6/5 = **1 1/5**
3. 15/4 x 8/5 = 3/1 x 2/1 = **6**
4. 21/4 x 2/7 = 3/2 x 1/1 = 3/2 = **1 1/2**
5. 1 2/3 ÷ 2 = 5/3 x 1/2 = **5/6**
6. 222 ÷ 4 1/2 = 222 x 2/9 = 444/9 = 49 3/9 = **49 1/3**
7. 15 3/4 ÷ 5 = 63/4 x 1/5 = 63/20 = **3 3/20**
8. 480 ÷ 7 1/2 = 480/1 x 2/15 = 32/1 x 2/1 = **64**

<u>Decimals</u>

Adding

1. **152.235**
2. **1.13475**
3. .85 + 1.06 + .35 = **$2.26**
4. 197.25 + 15.75 = **$213.00**

Subtracting

1. **.046**
2. **287.1503**
3. **.0069**
4. 125.00 – 89.99 = **35.01**

Multiplying

1. **.0122**
2. **.05652**
3. **.12**
4. 50 x 10.25 = **512.50**
5. 40 x 7.5 = 300
   6 x 11.25 = 67.50
   300 + 67.5 = **367.50**

Dividing

1. **3.264**
2. **1.87**
3. 675.25 ÷ 2.5 = **270.10**
4. 11.25 ÷ .25 = **45**

Converting Fractions, Decimals, and Percents

Decimal	Fraction	Percent
.25	**1/4**	**25%**
.625	5/8	**62.5%**
.5	**50/100 = 1/2**	50%
.6666	2/3	**66.666%**
.45	**45/100 = 9/20**	**45%**
.3	**3/10**	30%
.2	1/5	**20%**
.75	**75/100 = 3/4**	**75%**

Percents

Solving for Part

1. .005 x 300 = **1.5**
2. .65 x 240 = **156**
3. .32 x 775 = **248**
4. 2.5 x 55 = **137.5**
5. .38 x 200 = **76**

Solving for Percent (%)

1. 62 x 100 = 6200
   6200 ÷ 124 = **50%**
2. 83 x 100 = 8300
   8300 ÷ 332 = **25%**
3. 34 = Part, 51 = Whole
   34 x 100 = 3400
4. 14.40 = Part, 1800 = Whole
   14.40 x 100 = 1440
   1440 ÷ 1800 = **.8%**
5. 2320 = Part, 160,000 = Whole
   2320 x 100 = 232,000
   232,000 ÷ 160,000 = **1.45%**

Solving for Whole

1. 770 x 100 = 77,000
   77,000 ÷ 175 = **440**
2. 844 x 100 = 84,400
   84,400 ÷ 80 = **1055**
3. 42 = Part, 7% = Percent
   42 x 100 = 4200
   4200 ÷ 7 = **600**
4. 25,000 Part, 20% = Percent
   25,000 x 100 = 2,500,000
   2,500,000 ÷ 20 = **125,000**
5. 6.75 = Part, 15% = Percent
   6.75 x 100 = 675
   675 ÷ 15 = **45**

Proportions

1. 5 x 105 = 525
   525 = 7N
   252 ÷ 7 = **75**
2. 17 x 63 = 1071
   1071 = 21N
   1071 ÷ 21 = **51**
3. $\frac{\mathbf{9}}{\mathbf{5}}$
4. $\frac{2}{5} = \frac{C}{325}$
   2 x 325 = 650
   650 ÷ 5 = **130**
5. $\frac{7}{5000} = \frac{P}{15000}$
   7 x 15000 = 105000
   105000 ÷ 5000 = **21**
6. $\frac{932}{2} = \frac{M}{7}$
   932 x 7 = 6524
   6542 ÷ 2 = **3262**

Solving Equations

1. 20 – 5 = **15**
2. 27 ÷ 4 = **6.75**
3. 8.5 – 2.5 = 6
   6 ÷ 2 = **3**
4. 8 + 1 = 9
   9 x 4 = **36**
5. 2 x 28 = 56
   56 ÷ 7 = **8**
6. N – 62 = 169.95
   169.95 + 62 = **$231.95**
7. 6K + 1K = 560
   7K = 560
   560 ÷ 7 = 80
   Kay sold 80 kits
   80 x 6 = **480 kits sold by Amy**

Adding Signed Numbers

1. +6 or 6
2. –14
3. –2
4. 0
5. –3
6. –49

Subtracting Signed Numbers

1. +2
2. –11
3. +1
4. 0
5. –23
6. –6

Multiplying Signed Numbers

1. –18
2. –45
3. –9
4. +96
5. –28
6. –120

Dividing Signed Numbers

1. 2
2. –2
3. –3
4. –2/3
5. 8
6. –8

Exponents

1. x^7
2. y^2
3. a^3
4. 3^4
5. v = 125 cubic inches
6. r^4

Multiplying Monomials

1. x^{-3}
2. x^3
3. a^2x^3
4. $x^0 = 1$
5. d^{-3}
6. $a^3b^{-1}c$

Dividing Monomials

1. a^9
2. $2d^2$
3. a^2
4. a^4
5. $x^{-2}y^{-1}z^4$
6. $xy^{10}z^6$

Order of Operations

1. 30
2. 25
3. 108
4. 8
5. 3
6. 80

Parentheses

1. 6
2. 60
3. 48
4. 283
5. –9
6. 304

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