

Accuplacer Elementary Algebra Study Guide for Screen Readers

The following sample questions are similar to the format and content of questions on the Accuplacer Elementary Algebra test. Reviewing these samples will give you a good idea of how the test works and just what mathematical topics you may wish to review before taking the test itself. Our purposes in providing you with this information are to aid your memory and to help you do your best.

Section One: Order of operations

When working with parentheses, or exponents, multiplication, division, subtraction, and addition, one must remember the order of operations. First, parentheses or exponents as one calculates from left to right. Second, multiplication or division as one calculates from left to right. And finally, addition or subtraction as one calculates from left to right.

Question One:

Three to the second power plus five minus square root of four plus four to the zero power.

Answer One:

The answer is thirteen.

Steps to the answer:

First simplify the exponents in square root of four.

Three squared will equal nine.

Four to the zero power equals one.

The square root of four equals two.

This will give nine plus five minus two plus one.

Next simplify the addition and subtraction from left to right.

Nine plus five equals fourteen.

Then the fourteen minus two equals twelve and then twelve plus one equals 13.

Question Two:

(five plus one) (four minus two) minus three.

Answer Two:

The answer is nine.

Steps to the answer:

First simplify the expressions in parentheses.

Five plus one equals six and four minus two equals two.

Then simplify multiplication.

Six times two equals twelve.

Then simplify subtraction and twelve minus three equals nine.

Question Three:

Three times seven to the second power.

Answer Three:

The answer is one hundred forty seven.

Steps to the answer:

First simplify seven to the second power, which equals forty nine.

Then, multiply three times forty nine, which equals one hundred forty seven.

Question Four:

Two times (seven plus three) to the second power.

Answer Four:

The answer is two hundred.

Steps to the answer:

First, add seven plus three which equals ten.

Then, take ten to the second power which equals one hundred.

Then, multiply to times one hundred which equals two hundred.

Question Five:

Forty nine divided by seven minus two times two.

Answer Five:

The answer is three.

Steps to the answer:

First, forty nine divided by seven equals seven and two times two equals four.

Then, seven minus four equals three.

Question Six:

Nine divided by three times 5 minus 8 divided by two plus twenty seven.

Answer Six:

The answer is thirty eight.

Steps to the answer:

First, simplify multiplication and division from left to right.

Nine divided by three equals three and eight divided by two equals four.

Then, three times five equals fifteen.

Next, simplify addition and subtraction from left to right.

Fifteen minus four equals eleven and eleven plus twenty seven equals thirty eight.

Question Seven:

Three plus two (five) minus the absolute value of negative seven.

Answer Seven:

The answer is six.

Steps to the answer:

First, take the absolute value of negative seven which equals positive seven.

Then multiply two times five which equals ten.

Then simplify addition and subtraction from left to right.

Three plus ten equals thirteen and thirteen minus seven equals six.

Question Eight:

Five times five minus four (four) all over two to the second power minus one.

Answer Eight:

The answer is three.

Steps to the answer:

First, simplify the numerator and the denominator of the fraction.

In the numerator, five times five equals twenty five and four times four equals sixteen.

Then, twenty five minus sixteen equals nine.

In the denominator, two to the second power equals four, then four minus one equals three.

Finally, divide the numerator by the denominator so nine divided by three equals three.

Question Nine:

Four to the second power minus 5 to the second power all over (4 minus 5) to the second power.

Answer Nine:

The answer is negative nine.

Steps to the answer:

First, simplify the numerator.

Four to the second power equals sixteen and five to the second power equals twenty five.

Then, sixteen minus twenty five equals negative nine.

Next, simplify the denominator.

Four minus five equals negative one and negative one to the second power equals positive one.

Finally, simplify the fraction so negative nine divided by one equals negative nine.

Question Ten:

Negative five to the second power.

Answer Ten:

The answer is negative twenty five.

Steps to the answer:

Because there are no parentheses, first simplify five to the second power which equals twenty five.

Then, apply the negative sign to get the answer of negative twenty five.

Section Two: Scientific Notation

All numbers in scientific notation have the following form:
non zero digit decimal rest of number times ten raised to a power.
Write questions one through three in Scientific Notation.

Question One:

Three hundred fifty million.

Answer One:

The answer is three point five times ten to the eighth power.

Question Two:

Five hundred twenty three ten quadrillionths.

The number is a zero and decimal followed by thirteen zeros followed by the digits five two three.

Answer Two:

The answer is five point two three times ten to the negative fourteenth power.

Question Three:

One hundred and twenty quintillion, five hundred quadrillion.

The number is one two zero five zero zero followed by fifteen zeros.

Answer Three:

The answer is one point two zero five times ten to the twentieth power.

Write questions four through six in expanded form.

Question Four:

Six point zero two times ten to the twenty third power.

Answer Four:

The answer is six hundred two septillion.

The number is six zero two followed by twenty one zeroes.

Question Five:

Three point zero times ten to the eighth power.

Answer Five:

The answer is three hundred million.

Question Six:

One point eight one nine times ten to the negative ninth power.

Answer Six:

The answer is one thousand eight hundred nineteen trillionths.

The number is zero point eight zeros followed by the digits one eight one nine.

Simplify. Write answers seven through ten in scientific notation.

Question Seven:

(three times ten to the third power) (five times ten to the sixth power).

Answer Seven:

The answer is one point five times ten to the tenth power.

Steps to the answer:

To multiply two numbers in scientific notation, multiply the three times five which equals fifteen.

Then multiply ten to the third times ten to the sixth power.

When multiplying powers add the exponents. This will equal fifteen times ten to the ninth power.

Move the decimal to the left one place to express the answer in scientific notation.

This gives the answer of one point five times ten to the tenth power.

Question Eight:

(three times ten to the negative fourth power) to the second power.

Answer Eight:

The answer is nine times ten to the negative eighth power.

Steps to the answer:

First, take three to the second power which equals nine.

Then, take (ten to the negative four) raised to the second power.

When raising a power to another power, multiply the exponents.

This gives the answer of ten to the negative eighth power.

Question Nine:

Six times ten to the ninth power all over three times ten to the fourth power.

Answer Nine:

The answer is two times ten to the fifth power.

Steps to the answer:

To divide two numbers in scientific notation, divide six by three which equals two.

Then, divide ten to the ninth power by ten to the fourth power.

When dividing with powers, subtract the exponents to get ten to the fifth power.

Question Ten:

(three point two times ten to the fifth power) (two times ten to the negative third power) all over two times ten to the negative fifth power.

Answer Ten:

The answer is three point two times ten to the seventh power.

Steps to the answer:

Simplify the numerator by multiplying three point two times two which equals six point four.

Then, multiply ten to the fifth power times ten to the negative third power, which equals ten to the second power because we add the exponents.

This will give six point four times ten to the second power in the numerator, and two times ten to the negative five in the denominator.

To divide the two numbers in scientific notation, divide six point four by two which equals three point two.

Then, divide ten to the second power by ten to the negative fifth power by subtracting the exponents which equals ten to the seventh power.

Section Three: Substitution

Find each value if x equals three, y equals negative four, and z equals two.

Question One:

$X Y Z$ minus four Z .

Answer One:

The answer is negative thirty two.

Steps to the answer:

First, substitute three for X , negative four for Y , and two for Z .

This gives a problem of three times negative four times two minus four times two.

Then, multiply three times negative four times two, which equals negative twenty four and multiply four times two which equals eight.

Then, subtract negative twenty four minus eight which equals negative thirty two.

Question Two:

Two X minus Y .

Answer Two:

The answer is ten.

Steps to the answer:

First, substitute three for X , and negative four for Y .

This gives a problem of two times three minus negative four.

Then, multiply two times three which equals six.

Then, six minus negative four is the same as six plus four which equals ten.

Question Three:

$X (Y$ minus three $Z)$.

Answer Three:

The answer is negative thirty.

Steps to the answer:

First, substitute three for X , negative four for Y , and two for Z .

This gives a problem of three times (negative four minus three times two).

Then, simplify in parentheses three times to which equals six.

Then, negative four minus six equals negative ten.

Then, multiply three times negative ten which equals negative thirty.

Question Four:

Five X minus Z all over $X Y$.

Answer Four:

The answer is negative thirteen over twelve.

Steps to the answer:

First, substitute three for X , negative four for Y , and two for Z .

This gives a problem of five times three minus two all over three times negative four.

Simplify the numerator by taking five times three, which equals fifteen and then fifteen minus two equals thirteen.

Then, simplify the denominator by taking three times negative four which equals negative twelve.

This results in the answer of negative thirteen over twelve.

Question Five:

Three Y to the second power minus two X plus four Z .

Answer Five:

The answer is fifty.

Steps to the answer:

First, substitute three for X , negative four for Y , and two for Z .

Which is three times negative four to the second power minus two times three plus four times two.

Then, simplify negative four to the second power which equals sixteen.

Then, simplify multiplication to get three times sixteen, which equals forty eight two times three equals six and four times two equals eight.

Then, simplify addition and subtraction from left to right to get forty eight minus six, which equals forty two and forty two plus eight equals fifty.

Section Four: Linear equations in one variable

Solve the following for x.

Question One:

Six X minus forty eight equals six.

Answer One:

The answer is X equals nine.

Steps to the answer:

To solve for X, isolate the variable on one side of the equation.

To do that, first add forty eight to each side of the equation.

This gives the equation six X equals fifty four, because six plus forty eight equals fifty four.

Then, divide each side of the equation by six. Fifty four divided by six equals nine.

Therefore, X equals nine.

Question Two:

(Two over three) times X minus five equals X minus three.

Answer Two:

The answer is X equals negative six.

Steps to the answer:

Multiply each side of the equation by three to eliminate the fraction.

The left side of the equation will be three (two over three X minus five).

The right side of the equation will be three (X minus three).

Use the distributive property on the left side of the equation to multiply three times two over three X and three times five.

The left side will now be to X minus fifteen.

Use the distributive property on the right side of the equation to multiply three times X and three times three.

The right side will now be three X minus nine.

To isolate the variable X, add fifteen to both sides of the equation.

The equation is now two X equals three X plus six, because minus nine plus fifteen equals six.

Then, subtract three X on both sides of the equation.

The equation is now negative X equals six, because two X minus three X equals negative X.

For the last step, multiply each side of the equation by negative one.

This gives the equation X equals negative six, because negative one times negative X equals positive X and negative one times six equals negative six.

Question Three:

Fifty minus X minus (three X plus two) equals zero.

Answer Three:

The answer is X equals twelve.

Steps to the answer:

First, distribute the negative sign to eliminate the parentheses.

This gives an equation of fifty minus X minus three X minus two equals zero.

Then, combine like terms on the left side of the equation.

This gives any equation of negative four X plus forty eight equals zero.

To isolate the variable X, subtract forty eight from each side of the equation.

The result is negative four X equals negative forty eight, because zero minus forty eight equals negative forty eight.

Then, divide each side of the equation by negative four.

The result is X equals twelve, because negative forty eight divided by negative four equals twelve.

Question Four:

Eight minus four (X minus one) equals two plus three (four minus X).

Answer Four:

The answer is X equals negative two.

Steps to the answer:

First, use the distributive property to eliminate parentheses on both sides of the equation.

On the left side of the equation, multiply negative four times X and negative four times the minus one.

On the right side of the equation multiply three times for and three times the minus X.

This gives an equation of eight minus four X plus four equals two plus twelve minus three X.

Then, combine eight plus four on the left side of the equation and two plus twelve on the right side of the equation. This gives the equation twelve minus four X equals fourteen minus three X.

To isolate the variable X, subtract twelve on each side of the equation.

This gives the equation negative four X equals two minus three X.

Then, add three X to each side of the equation.

This gives the equation negative X equals two.

Finally, multiply each side of the equation by negative one.

This gives the equation X equals negative two.

Formulas

Question One:

Solve the formula $P V$ equals $n R T$ for the variable T .

Answer One:

The answer is T equals $P V$ all over $n R$.

Steps to the answer:

To solve for the variable T , divide each side of the equation by $n R$.

This will give the equation T equals $P V$ all over $n R$.

Question Two:

Solve the equation Y equals three X plus two for the variable X .

Answer Two:

The answer is Y minus 2 all over three equals X .

Steps to the answer:

To solve for the variable X , first, subtract two from each side of the equation.

This gives the equation Y minus two equals three X .

Then, divide each side of the equation by three.

This gives the equation Y minus two all over three equals X .

Question Three:

Solve the formula C equals two πR for the variable R .

Answer Three:

The answer is R equals C over two π .

Steps to the answer:

To solve for the variable R , divide each side of the formula by two π .

This gives the formula R equals C over two π .

Question Four:

Solve the equation X over two plus Y over five equals one for the variable Y .

Answer Four:

The answer is the equation Y equals negative five over two X plus five.

Steps to the answer:

To solve for the variable Y , multiply both sides of the equation by five.

This will give the equation five (X over two plus Y over five) equals five times one.

Use the distributive property on the left side of the equation to get five over two X plus Y .

The entire equation is now five over two X plus Y equals five.

Then, subtract five over two X on each side of the equation.

This gives the equation Y equals negative five over two X plus five.

Question Five:

Solve the equation Y equals $H X$ plus four X for the variable X .

Answer Five:

The answer is Y over H plus four equals X .

Steps to the answer:

To solve for the variable X , factor out a X from each term on the right side of the equation.

This will give the equation of Y equals X (H plus four).

Then, divide each side of the equation by H plus four.

This will give the equation of Y over H plus four equals X .

Section Five: Word Problems

Question One:

One number is five more than twice another number.
The sum of the numbers is thirty five.
Find the numbers.

Answer One:

One number equals twenty five and another number equals ten.

Steps to the answer:

Let X equal another number forcing the equation two X plus five to equal one number.

The equations X plus two X plus five equals thirty five represents the sum of the two numbers equaling thirty five.

Solve the equation by combining like terms on the left side to get three X plus five equals thirty five.

To isolate the variable X , subtract five on both sides of the equation to get three X equals thirty.

Then, divide both sides by three to get X equals ten.

To find the other number, multiply 10 times two and add five to get twenty five.

Question Two:

Ms. Jones invested eighteen thousand dollars in two accounts.

One account pays six percent simple interest and the other pays eight percent.

Her total interest for the year was one thousand two hundred ninety dollars.

How much did she have in each account?

Answer Two: Ms. Jones has seven thousand five hundred dollars in the account paying six percent interest, and ten thousand five hundred dollars in the account paying eight percent interest.

Steps to the answer:

Let X equal the dollars in the account paying six percent interest.

Then, eighteen thousand minus X equals the dollars in the account paying eight percent interest.

The interest dollars are calculated by multiplying the total dollars in the account by the interest rate. Hence: point zero six X equals the interest earned by the first account and point zero eight (eighteen thousand minus X) equals the interest earned by the second account.

Adding up all the interest, point zero six X plus point zero eight (eighteen thousand minus X) equals one thousand two hundred ninety.

Solving the equation for variable X , X equals seven thousand five hundred dollars.

That amount represents the money in the account paying six percent interest.

To find the amount in the account paying eight percent interest, take eighteen thousand minus seven thousand five hundred which equals ten thousand five hundred; the amount in the second account.

Question Three:

How many liters of a forty percent solution and a sixteen percent solution must be mixed to obtain twenty liters of a twenty two percent solution?

Answer Three:

There are five liters at forty percent and fifteen liters at sixteen percent.

Steps to the answer:

The study guide organizes the information in buckets.

A bucket is a square with two pieces of information from the problem.

Let X represent the amount of the forty percent solution.

So in the first bucket, there is the variable X , and underneath the variable X is forty percent to represent the forty percent solution.

The second bucket has the expression twenty minus X to represent a total of twenty liters minus the forty percent solution.

The second bucket is labeled sixteen percent to represent the sixteen percent solution.

In between these two buckets is in addition sign to represent mixing the solutions.

When adding the two buckets it equals a third of bucket that contains the number twenty liters with a label of twenty two percent to represent the twenty two percent solution.

The buckets represent a way to organize the information in the problem so that any equation can be written.

From the buckets we get the equation point four X plus point one six (twenty minus X) equals twenty times point twenty two. Notice each percent was converted to a decimal.

Solving the equation for X gives that X equals five.

The variable X represents the leaders of forty percent solution, so there are five leaders of forty percent solution.

To find the leaders of sixteen percent solution, take twenty minus five to get fifteen leaders of the sixteen percent solution.

Question Four:

Sheila bought burgers and fries for her children and some friends. The burgers cost two dollars and five cents each and the fries are eighty five cents each. She bought a total of fourteen items, for a total cost of nineteen dollars and ten cents. How many of each did she buy?

Answer Four:

Sheila bought six burgers and eight fries.

Steps to the answer:

Let X equal the number of burgers and let fourteen minus X equal the number of fries.

To get the total amount of money spent, multiply the number of items by the cost of the item.

So, two point zero five times X equals the total dollars spent on burgers, and point eight five (fourteen minus X) equals the total dollars spent on fries.

The equation is: two point zero five times X plus point eight five (fourteen minus X) equals nineteen point one zero.

Solving the equation for variable X , gives X equals six.

This represents the number of burgers Sheila bought.

To find the number of fries Sheila bought take fourteen minus six which equals eight.

So she bought eight fries.

Section six: Inequalities

Solve any qualities the same as equations with one exception.

When both sides are multiplied or divided by a negative number, remember to switch the direction of the inequality.

Solve and graph on the number line.

Question One:

Two X minus seven is greater than or equal to three.

Answer One:

The answer is X is greater than or equal to five.

The graph is a horizontal number line with a closed circle on the number five and the number line is shaded to the right of the number five.

Steps to the answer:

To solve this inequality, isolate the variable X.

First, add seven to both sides of the inequality.

This gives the inequality to X is greater than or equal to ten.

Then, divide both sides by two.

This results in the inequality X is greater than or equal to five.

To graph the solution, use a horizontal number line.

Because the solution was X is greater than or equal to five, put a circle on the number five and fill in the circle because of the greater than or equal to sign.

Because it is greater than or equal to five shade the number line to the right of the number five to represent all numbers greater than or equal to five.

Question Two:

Negative five (two X plus three) is less than two X minus three.

Answer Two:

The answer is X is greater than negative one. The graph is a horizontal number line with an open circle on the number negative one and the number line is shaded to the right of negative one.

Steps to the answer:

To solve this inequality, first use the distributive property by multiplying negative five times two X and negative five times positive three.

This results in the inequality of negative ten X minus fifteen is less than two X minus three.

Then, isolate the variable X by adding fifteen to both sides of the inequality.

This results in the inequality negative ten X is less than two X plus twelve because fifteen minus three equals twelve.

Then, subtract two X on both sides of the equation.

This results in the inequality of negative twelve X is less than twelve.

Finally, divide each side of the inequality by negative twelve.

Remember when you multiplied by a negative you must switch the direction of the inequality.

This results in the inequality of X is greater than negative one, because twelve divided by negative twelve is negative one.

To graph the solution, use a horizontal number line.

Because the solution was X is greater than negative one, put an open circle on negative one.

An open circle can be described as a circle that is not colored in.

Use an open circle because the inequality is just greater than.

Then, shade the number line to the right of the number negative one to represent all numbers greater than negative one.

Question Three:

Three (X minus four) minus (X plus one) is less than or equal to negative twelve.

Answer Three:

The answer is X is less than or equal to one over two or point five.

The graph is a horizontal number line with a closed circle on the number one over two and the number line is shaded to the left of one over two.

Steps to the answer:

To solve this inequality use the distributive property twice to eliminate the parentheses.

First, multiply three times X and three times minus four to get three X minus twelve.

Then, distribute the minus to the X and to the plus one to get negative X minus one.

This results in the inequality three X minus twelve minus X minus one is less than or equal to negative twelve.

Combine like terms on the left side of the inequality to get to two X minus thirteen is less than or equal to negative twelve.

Isolate the X by adding thirteen to each side of the inequality.

This results in the inequality of two X is less than or equal to one.

Finally, divide each side of the inequality by two.

Because we are dividing by a positive number, do not switch the inequality sign.

This results in the inequality of X is less than or equal to one over two.

To graph the solution, use a horizontal number line.

Because the solution was X is less than or equal to one over two, use a closed circle at the number one over two.

Then, shade the number line to the left of the one over two to represent all numbers less than or equal to one over two.

Section Seven: Exponents & polynomials

Simplify and write answers with positive exponents.

Question One:

(three X to the second power minus five X minus six) plus (five X to the second power plus four X plus four).

Answer One:

The answer is eight X to the second power minus X minus two.

Steps to the answer:

To simplify, add like terms.

First add three X to the second power with five X to the second power to get eight X to the second power.

Then, add negative five X with four X to get negative or minus X.

Then, combined negative six with positive four to get negative or minus two.

Write these three terms in a horizontal line to get the answer of eight X to the second power minus X minus two.

Question Two:

This problem is a fraction described as:

(two times A to the negative five times B to the fourth power times C to the third power) all raised to the negative to power all over (three times A to the third power times B to the negative seven power times C to the third power) all raised to the second power.

Answer Two:

The answer is the fraction: A to the fourth power times B to the sixth power all over thirty six times C to the twelfth power.

Steps to the answer:

To simplify the numerator, raise each number and variable to the negative to power to eliminate parentheses. Remember, when raising a power to a power, multiply the exponents.

This results in the numerator being two to the negative to power times A to the tenth power times B to the negative eight power times C to the negative six power.

To simplify the denominator, raise each number in variable to the second power.

This results in the denominator being three to the second power times A to the six power times B to the negative fourteen power times C to the sixth power.

Next, use properties of exponents to simplify the variables in the numerator and denominator.

Subtract the exponents since this is a fraction. So, take A to the ten minus six power to get A to the fourth power.

Then, take B to the negative eight minus negative fourteen power to get B to the sixth power.

Then, take C to the negative six minus six power to get C to the negative twelve power.

To work with the numbers in the fraction, move the two to the negative to power to the denominator.

Remember, to make a negative exponent turn into a positive exponent, move the term to the other side of the fraction. This will then make the denominator have the number two to the positive to power times three to the second power.

To simplify the numbers, two to the second power equals four and three to the second power equals nine and nine times for equals thirty six.

To write the answer as a single fraction with positive exponents, move the C to the negative twelve power to the denominator to make it a positive twelve power. Since A to the fourth power and B to the sixth power have positive exponents, these variables will stay in the numerator.

This results in the fraction of A to the fourth power times B to the sixth power all over thirty six times C to the twelfth power.

Question Three:

(three X to the zero power times Y to the fifth power times Z to the sixth power) times (negative two X times Y to the third power times Z to the negative two power).

Answer Three:

The answer is negative six times X times Y to the eighth power times Z to the fourth power.

Steps to the answer:

To simplify this expression, use properties of exponents. Since the parentheses are separated by multiplication, add the exponents that have the same variable.

So, add X to the zero with X to the first power to get X to the first power because one plus zero equals one.

Then, add the exponents of Y to the fifth power with Y to the third power to get Y to the eighth power.

Then add the exponents of Z to the sixth power with Z to the negative to power to get Z to the negative four power.

Finally multiply the two numbers three times negative two to get negative six.

This results in the answer of negative six times X to the first power times Y to the eighth power times Z to the fourth power.

Question Four:

(negative A to the fifth power times B to the seventh power times C to the ninth power) all raised to the fourth power.

Answer Four:

The answer is A to the twentieth power times B to the twenty eighth power times C to the thirty six power.

Steps to the answer:

To simplify this expression, use properties of exponents.

When raising a power to a power, multiply the exponents.

First, treat the negative sign as a negative one.

Then raise negative one to the fourth power which results in a positive one.

Then, multiply the A to the fifth power times for to get A to the twentieth power.

Then, multiply B to the seventh power times for to get B to the twenty eighth power.

Finally, multiply C to the ninth power times for to get C to the thirty six power.

This results in the answer of A to the twentieth power times B to the twenty eighth power times C to the thirty six power.

Question Five:

(four times X to the second power times Y to the sixth power times Z) all raised to the second power times (negative X to the negative to power times Y to the third power times Z to the fourth power) all raised to the sixth power.

Answer Five:

The answer is sixteen times Y to the thirtieth power times Z to the twenty sixth power all over letter X to the eighth power.

Steps to the answer:

To simplify this expression use the following properties of exponents.

When raising a power to a power, multiply the exponents.

Then, to combine variables with the same letter, add the exponents.

Then, write any variable or number with negative exponents as a fraction.

In this problem, raise each number in variable in the first set of parentheses all to the second power.

This results in four to the second power which equals sixteen times X to the two times two which equals X to the fourth power times Y to the six times to which equals Y to the twelfth power times Z to the one times two power which equals the to the second power.

In the second set of parentheses, treat the negative sign as negative one and raise negative one to the sixth power which equals one times X to the negative two times six power which equals X to the negative twelve power times Y to the three times six power which equals Y to the eighteenth power times Z to the four times six power which equals Z the twenty fourth power.

To summarize, the problem now looks like (sixteen times X to the fourth power times Y to the twelfth power times Z to the second power) times (X to the negative twelve power times Y to the eighteenth power times Z to the twenty fourth power).

Now add the exponents that have the same variable.

This results in the expression sixteen times X to the negative eighth power times Y to the thirtieth power times Z to the twenty sixth power.

Because, the X to the negative eight is a negative exponent, move the X to the negative eight into the denominator.

This results in the fraction of sixteen times Y to the thirtieth power times Z to the twenty sixth power all over letter X to the eighth power.

Question Six: This problem is the fraction: twenty four times X to the fourth power minus thirty two times X to the third power plus sixteen times X to the second power all over eight times X to the second power.

Answer Six:

The answer is three times X to the second power minus four times X plus two.

Steps to the answer:

Divide each term in the numerator by the eight X to the second power in the denominator.

First, twenty four times X to the fourth over eight times X to the second equals three times X to the second because twenty four divided by eight is three and X two E fourth power divided by X to the second power equals X to the second power.

Then, divide minus thirty two X to the third power by eight times X to the second power to get minus four X, because thirty two divided by eight equals four and X to the third power divided by X to the second power equals X to the first power.

Finally, divide sixteen times X to the second power by eight X to the second power to get two, because sixteen divided by eight equals two and X to the second power divided by X to the second power equals one.

This results in the answer of three times X to the second power minus four times X plus two.

Question Seven:

(X to the second power minus five times X) times (two times X to the third power minus seven).

Answer Seven:

The answer is two times X to the fifth power minus ten times X to the fourth power minus seven times X to the second power plus thirty five times X.

Steps to the answer:

To simplify this problem, use the distributive property twice.

First, distribute the letter X to the second power to the two times X to the third power and to the minus seven. This results in two times X to the fifth power minus seven times X to the second power.

Then, distribute the minus five times X to the two times X to the third power and to the minus seven. This results in minus ten times X to the fourth power plus thirty five times X.

Finally, rewrite the polynomial in order from the term with the largest exponent to the term with the smallest exponent.

This results in the answer of two times X to the fifth power minus ten times X to the fourth power minus seven X to the second power plus thirty five times X.

Question Eight:

This problem is a fraction: twenty six times A to the second power times B to the negative five power times C to the ninth power all over negative four times a to the negative sixth power times B to the first power times C to the ninth power.

Answer Eight:

The answer is the following fraction: negative thirteen times A to the eighth power over two times B to the sixth power.

Steps to the answer:

To simplify this expression, use properties of exponents.

Since the problem involves a fraction, subtract the exponents that have the same variable.

Treat the numbers twenty six and negative four like reducing a normal fraction with no variables.

Working with the numbers twenty six over negative four, this simplifies to negative thirteen over two.

When working with the variables, take letter A to the two minus negative six which equals A to the eight power.

Then, take B to the negative five minus one power which equals B to the negative sixth power.

Then, take C to the nine minus nine power which equals C to the zero power.

To further simplify move B to the negative six power to the denominator of the fraction so that the exponent becomes positive.

Also C to the zero power equals one.

This results in the answer of negative thirteen times A to the eighth power over to times B to the sixth power.

Question Nine:

(five times A plus six) raised to the second power.

Answer Nine:

The answer is twenty five times A to the second power plus sixty times A plus thirty six.

Steps to the answer:

To simplify this expression, remember that raising a binomial to the second power is the same as multiplying a binomial by a binomial.

Therefore, rewrite the problem as (five times A plus six) times (five times A plus six).

Then, use the distributive property twice to simplify.

First, multiply five A times five A to get twenty five times A to the second power.

Then, multiply five A times six to get thirty times A.

Next, multiply six times five A to get thirty times A.

Finally, multiply six times six to get thirty six.

This results in the expression twenty five times A to the second power plus thirty times A plus thirty times A plus thirty six.

Then, combine like terms to get twenty five times A to the second power plus 60 times A plus 36.

Section Eight: Factoring

Steps to factoring:

Step One: Always factor out the greatest common factor, if possible.

Step two: Factor the first and third term.

Step three: Figure out the middle term.

Question One:

X to the second power plus five X minus six

Answer One:

The answer is (X plus 6) times (X minus one).

Question Two:

X to the second power minus five X minus six.

Answer Two:

The answer is (X plus 1) times (X minus six).

Question Three:

Four X to the second power minus thirty six.

Answer Three:

The answer is four times (X plus three) times (X minus three).

Steps to the answer:

First, factor out the common factor of four to get four (X to the second power minus nine).

The binomial in parentheses is a difference of perfect squares so it can be factored.

Therefore, X to the second power plus 9 factors into (X plus three) times (X minus three).

Putting all the factors together gives the answer of four times (X plus three) times (X minus three).

Question Four:

X to the second power plus 4.

Answer Four:

This is not factorable.

The sum of two squares requires the complex number system to factor.

Question Five:

Sixty four X to the fourth power minus four Y to the fourth power.

Answer Five:

The answer is four times (two X minus Y) times (two X plus Y) times (four X to the second power plus Y to the second power).

Steps to the answer:

First, factor the greatest common factor of four from each term.

This results in four times (sixteen X to the fourth power minus Y to the fourth power).

The binomial in parentheses is a difference of squares and can be factored into (four X to the second power minus Y to the second power) times (four X to the second power plus Y to the second power).

Next, the binomial (four X to the second power minus Y to the second power) is another difference of squares and can be factored into (two X minus Y) times (two X plus Y).

The other binomial of (four X to the second power plus Y to the second power) cannot be factored because it is a sum of two perfect squares.

Putting the factors together gives the answer of four times (two X minus Y) times (two X plus Y) times (four X to the second power plus Y to the second power).

Question Six:

Eight X to the third power minus twenty seven.

Answer Six:

The answer is (two X minus three) times (four X to the second power plus 6 X plus 9)

Steps to the answer:

This is a difference of two perfect cubes.

Use the formula:

A to the third power minus B to the third power equals (A minus B) (A to the second power plus A times B plus B to the second power).

Let A equal to X because two X times two X times two X equals the first term of eight X to the third power.

Then, let B equal three because three times three times three equals the second term of twenty seven.

Use the formula to get the answer of (two X minus three) times (four X to the second power plus six X plus nine).

Question Seven:

Forty nine Y to the second power plus eighty four Y plus thirty six.

Answer Seven:

The answer is (seven Y plus six) to the second power.

Steps to the answer:

Forty nine Y to the second power plus eighty four Y plus thirty six can first be factored into (seven Y plus six) times (seven Y plus six).

This can be written in exponential form to get the answer of (seven Y plus six) to the second power.

Question Eight:

Twelve X to the second power plus twelve X plus three.

Answer Eight:

The answer is three times (two X plus one) to the second power.

Steps to the answer:

First, factor the greatest common factor of three from each term to get three (four X plus six plus three).

Then factor remaining binomial to get three (two X plus one) times (two X plus one).

This can be written in exponential form to get the answer of three times (two X plus one) to the second power.

Section nine: Quadratic Equations

Steps to solve quadratic equations:

Step one: get a zero on one side of the equals sign.

Step two: factor.

Step three: set each factor equal to zero.

Step four: solve for your variable.

If you cannot factor the equation and the quadratic is in standard form which is $Ax^2 + Bx + C = 0$, then use the quadratic formula.

The quadratic formula is: $x = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$

Question One:

Four A to the second power plus nine A plus two equals zero.

Answer One:

The answer is $A = -\frac{1}{4}$ or $A = -2$.

Steps to the answer:

First, factor the left side of the equation to get $(4A + 1)(A + 2) = 0$.

Then, set each factor equal to zero.

This results in the two equations of $4A + 1 = 0$ and $A + 2 = 0$.

Solve each equation for variable A to get the two solutions of $A = -\frac{1}{4}$ or $A = -2$.

Question Two:

Nine X to the second power minus eighty one equals zero.

Answer Two:

The answer is $X = 3$ and $X = -3$.

Question Three:

Twenty five X to the second power minus six equals thirty.

Answer Three:

The answer is $X = \frac{6}{5}$ and $X = -\frac{6}{5}$.

Steps to the answer:

First, get zero on the right side of the equation by subtracting thirty on both sides of the equation.

This results in the equation $25X^2 - 6 - 30 = 0$.

Then factor the left side of the equation to get $(5X + 6)(5X - 6) = 0$.

Next, set each factor equal to zero to get the two equations of $5X + 6 = 0$ and $5X - 6 = 0$.

Solve each equation to get the answer of $X = \frac{6}{5}$ and $X = -\frac{6}{5}$.

Question Four:

Three X to the second power minus five X minus two equals zero.

Answer Four:

The answer is $X = 2$ or $X = -\frac{1}{3}$.

Question Five:

$(3X + 2)$ to the second power equals sixteen.

Answer Five:

The answer is $X = \frac{2}{3}$ or $X = -2$.

Steps to the answer:

First, multiply $(3X + 2)$ to the second power on the left side of the equation to get $9X^2 + 12X + 4 = 16$.

Then, get zero on one side of the equation by subtracting sixteen on each side.

This results in the equation of $9X^2 + 12X - 12 = 0$.

Next, factor the left side of the equation by first factoring out the greatest common factor of three.

This results in the equation of $3(3X^2 + 4X - 4) = 0$.

Then, factor the trinomial in parenthesis to get the equations $3(3X - 2)(X + 2) = 0$.

Then, to solve for X , divide both sides of the equation by three to get the equation of $(3X - 2)(X + 2) = 0$.

Then, set each factor equal to zero to get the two equations of $3X - 2 = 0$ and $X + 2 = 0$.

Solve each equation for X to get the answer of $X = \frac{2}{3}$ or $X = -2$.

Question Six:

R to the second power minus two R minus four equals zero.

Answer Six:

One plus or minus the square root of five.

Steps to the answer:

Use the quadratic formula to solve this equation.

Let A equal one, let B equal negative two and let C equal negative four.

The quadratic formula is: X equals negative B plus or minus the square root of (B to the second power minus four times A times C) all over two times A.

Use the values of A, B and C, then simplify the numbers using order of operation to get the answer of one plus or minus the square root of five.

Section Ten: Rational Expressions

Perform the following operations and simplify where possible. If given an equation, solve for the variable.

Question One:

The problem has two fractions. The first fraction is four over two A minus two plus the second fraction which is three A over A to the second power minus A.

Answer One:

The answer is the fraction five over A minus one.

Steps to the answer:

You need to find a common denominator (factor denominators to see what you need), add, and then reduce (if possible) at the very end.

Factoring the denominator of the first fraction results in four over two times (A minus one) and factoring the denominator of the second fraction results in three A over A times (A minus one).

So, the common denominator is two A times (A minus one).

Now, rewrite each fraction has the common denominator.

Multiply the first fraction four over two times (A minus one) by A over A period this results in the equivalent fraction of four A over two A times (A minus one).

Multiply the second fraction of three A over A times (A minus one) by two over two.

This results in the second fraction being six A over two A times (A minus one).

Now that the fractions have a common denominator, add the numerators.

So, four A plus six A equals ten A.

This results in one fraction which is ten A over two A (A minus one).

Reduce the ten A over two A which results in five over A minus one.

Question Two:

The problem contains two fractions. The first fraction is three over X to the second power minus one. Take the first fraction and subtract the second fraction which is four over X to the second power plus three X plus two.

Answer Two:

The answer is the fraction negative X plus ten all over (X minus one) times (X plus one) times (X plus two).

Steps to the answer:

This problem uses the same technique as number one. Be careful of the subtraction.

Factor the denominator of the first fraction which results in three over (X minus one) times (X plus one).

Factor the denominator of the second fraction which results in four over (X plus two) times (X plus one).

The common denominator of the two fractions is (X plus one) times (X minus one) times (X plus two).

Multiply the first fraction of three over (X minus one) times (X plus one) by (X plus two) over (X plus two).

This results in the equivalent fraction of three X plus six all over (X minus one) times (X plus one) times (X plus two).

Multiply the second fraction of four over (X plus two) times (X plus one) by (X minus one) over (X minus one).

This results in the equivalent fraction of four X minus four all over (X minus one) times (X plus one) times (X plus two).

Now that there is a common denominator, subtract the like terms in the numerator. So, three X minus four X equals negative X and six minus a negative four is positive ten.

This results in the answer of negative X plus ten all over (X minus one) times (X plus one) times (X plus two).

Question Three:

The problem contains two fractions being multiplied. The first fraction is six X minus eighteen all over three X to the second power plus two X minus eight. The second fraction is twelve X minus sixteen all over four X minus twelve.

Answer Three:

The answer is the fraction six over X plus two.

Steps to the answer:

Two multiply fractions, factor in cancel common factors first before multiplying.

Factor the numerator and the denominator of the first fraction to get six times (X minus three) all over (three X minus four) times (X plus two).

Factor the numerator and the denominator of the second fraction to get four times (three X minus four) all over four times (X minus three).

Now cancel common factors that appear in the numerator and the denominator.

Cancel the factor of (X minus three) in the numerator of the first fraction with the same factor of (X minus three) that is in the denominator of the second fraction.

Cancel the factor of (three X minus four) and the denominator of the first fraction with the same factor of (three X minus four) that is in the numerator of the second fraction.

Cancel the number four that is in the numerator and the denominator of the second fraction.

All the common factors have been canceled so multiply straight across the numerator and straight across the denominator.

The numerator just has the number six and the denominator just has the factor of (X plus two).

This results in the answer of six over X plus two.

Question Four:

This problem is about fractions separated by division. The first fraction is sixteen minus X to the second power all over X to the second power plus two X minus eight. The second fraction is X to the second power minus two X minus eight all over four minus X to the second power.

Answer Four:

The answer is one.

Steps to the answer:

Division is the same process with one extra step (invert and multiply): for example A over B divided by C over D equals A over B times D over C .

One other hint: $(one\ minus\ X)$ equals negative one times $(X\ minus\ one)$.

To solve this problem first, factor the numerator and denominator of each fraction.

The first fraction factors into $(four\ minus\ X)$ times $(four\ plus\ X)$ all over $(X\ minus\ two)$ times $(X\ plus\ four)$.

The second fraction factors into $(X\ minus\ four)$ times $(X\ plus\ two)$ all over $(two\ minus\ X)$ times $(two\ plus\ X)$.

Next, invert the second fraction which results in $(two\ minus\ X)$ times $(two\ plus\ X)$ all over $(X\ minus\ four)$ times $(X\ plus\ two)$. Because we inverted the second fraction, put a multiplication sign between the two fractions in the problem.

Use the second hint to factor out a negative one from the factor of $(four\ minus\ X)$ which is in the numerator of the first fraction and in the factor of $(two\ minus\ X)$ which is in the numerator of the second fraction.

This results in the following fractions. The first fraction is negative one times $(X\ minus\ four)$ times $(four\ plus\ X)$ all over $(X\ minus\ two)$ times $(X\ plus\ four)$. The second fraction is negative one times $(X\ minus\ two)$ times $(two\ plus\ X)$ all over $(X\ minus\ four)$ times $(X\ plus\ two)$. The two fractions are separated by multiplication.

Similar to number three, cancel the common factors that occur in the numerator and the denominator of either fraction.

Cancel the factor of $(X\ minus\ four)$ in the numerator of the first fraction by the same factor of $(X\ minus\ four)$ in the denominator of the second fraction.

Cancel the factor of $(four\ plus\ X)$ in the numerator of the first fraction by the factor of $(X\ plus\ four)$ in the denominator of the first fraction. Note, that $(four\ plus\ X)$ is the same as $(X\ plus\ four)$.

Cancel the factor of $(X\ minus\ two)$ in the denominator of the first fraction by the same factor of $(X\ minus\ two)$ in the numerator of the second fraction.

Cancel the factor of $(two\ plus\ X)$ in the numerator of the second fraction by the factor of $(X\ plus\ two)$ and the denominator of the second fraction. Note, that $(two\ plus\ X)$ is the same as $(X\ plus\ two)$.

Since all of the factors canceled, the first fraction is now represented as negative one over one times the second fraction which is also negative one over one.

Multiplying the two fractions results in the answer of positive one.

Question Five:

Simplify the fraction X to the third power minus one all over X minus one.

Answer Five:

The answer is X to the second power plus X plus one.

Factor and reduce the fraction to get the answer.

Question Six:

This problem contains a complex fraction.

A complex fraction contains fractions in the numerator and fractions in the denominator.

Simplify the complex fraction: the numerator of the complex fraction contains two fractions separated by a minus sign. The numerator of the complex fraction is two over X minus the second fraction of one over Y . The denominator of the complex fraction is the fraction one over X times Y .

Answer Six:

The answer is two Y minus X .

Steps to the answer:

Find the lowest common denominator for all the fractions, then multiplied the numerator and denominator of the complex fraction by the lowest common denominator.

The lowest common denominator for the complex fraction is X times Y .

Multiply the numerator and the denominator of the complex fraction by X times Y .

For the numerator of the complex fraction multiplying $(two\ over\ X\ minus\ one\ over\ Y)$ by X times Y results in two Y minus X .

For the denominator of the complex fraction multiplying $(one\ over\ X\ Y)$ by X times Y results in one.

Now the fractions in the numerator and denominator of the complex fraction are gone.

The fraction is simplified into two Y minus X all over one.

This results in the answer of two Y minus X .

Question Seven:

Solve the equation. This equation contains three fractions. The left side of the equation is two over X minus one plus another fraction which is one over X plus one. The right side of the equation equals the fraction five over four.

Answer Seven:

The answer is X equals negative three over five or X equals three.

Steps to the answer:

To solve equations with fractions, annihilate the denominators by multiplying both sides of the equation by the lowest common denominator. Then solve the resulting fraction less equation in check answers in the original equation to ensure that the denominators are not zero.

For this problem the lowest common denominator is four times (X minus one) times (X plus one).

Multiply each fraction by the lowest common denominator to annihilate the denominators.

This results in the equation of two times (X plus one) times four plus (X minus one) times four equals five times (X minus one) times (X plus one).

Use the distributive property to simplify each side of the equation. This results in the equation of eight X plus eight plus four X minus four equals five X to the second power minus five.

Combine like terms on the left side of the equation which results in the equation of twelve X plus four equals five X to the second power minus five.

Since this is now a quadratic equation, get zero on one side of the equation by subtracting twelve X to each side of the equation and subtracting four to each side of the equation.

This results in the equation of five X to the second power minus twelve X minus nine equals zero.

Factor the left side of the equation to get the equation of (five X plus three) times (X minus three) equals zero.

Set each factor equal to zero and solve for the variable X to get the answers of X equals negative three over five or X equals three.

Since these answers do not make the denominator zero in the original equation, they are the solution.

Question Eight:

Solve the equation (3 over K) plus one equals the fraction of three plus K all over two K.

Answer Eight:

The answer is K equals negative three.

Question Nine:

Solve the equation that contains three fractions. The left side of the equation is five minus X all over X plus the second fraction of three over four equals the right side of the equation which is the fraction seven over X.

Answer Nine:

The answer is X equals negative eight.

Section Eleven: Graphing

Graph each equation on the coordinate axis.

A coordinate axis has a horizontal X axis and a vertical Y axis.

The point where the two axis intersect is at the coordinate point (zero, zero), called the origin.

Question One:

Three X minus two Y equals six.

Answer One:

The graph is a line that has an X intercept of two and a Y intercept at negative three. The line goes through each intercept is has a positive slope. A positive slope means the line is going up as the graph moves from left to right.

Question Two:

X equals negative three.

Answer Two:

The graph is a vertical line that crosses the X axis at negative three.

Question Three:

Y equals two.

Answer Three:

The graph is a horizontal line that crosses the Y axis at two.

Question Four:

Y equals negative (two over three) times X plus five.

Answer Four:

The graph is a line that crosses the Y axis at five. From there, use the slope of negative two over three to plot another point. Starting at the point (zero, five), move down two units and to the right three units to land on the coordinate point of (three, three). Connect the two points of (zero, five) and (three, three) to draw the line.

Question Five:

Y equals the absolute value of (X minus three).

Answer Five:

The graph is a V shape graph where the bottom part of the V touches the X axis at the coordinate point (three, zero).

To graph this equation, choose X values to substitute into the equation to find the respective Y values. For example, substituting a zero in for the variable X gives the equation Y equals the absolute value of (zero minus three).

Simplifying the equation results in Y equals three. So, one of the coordinate points is (zero, three).

This can be done for other values of X until there are enough coordinate points to make the V shape graph.

Question Six:

Y equals negative X to the second power plus two.

Answer Six:

The graph is of a parabola that is opening downward. The highest point of the parabola is at the coordinate point (zero, two). The parabola crosses the x axis at two locations. One location is between the values of negative two and negative three and the other location is between the values of one and two.

To graph this equation, choose X values to substitute into the equation to find the respective Y values. For example, substituting a zero in for the variable X gives the equation Y equals negative zero to the second power plus two.

Simplifying the equation results in Y equals two.

So, one of the coordinate points is (zero, two).

This can be done for other values of X until there are enough coordinate points to the parabola.

Remember, a parabola is a U shaped graph.

Question Seven:

Y equals the square root of (X plus two)

Answer Seven:

The graph is a smooth curve that starts at the coordinate point of (negative two, zero) and increases as is moves to the right or as the X values increase.

To graph this equation, choose X values to substitute into the equation to find the respective Y values. For example, substituting a negative two in for the variable X gives the equation Y equals the square root of negative two plus two. Simplifying the equation results in Y equals zero. So, one of the coordinate points is (negative two, zero). This can be done for other values of X until there are enough coordinate points to the parabola. Remember, a parabola is a U shaped graph.

Section Twelve: Systems of Equations

Solve the following systems of equations.

The following are two dimensional linear equations.

Each equation represents a line that can be graphed on the coordinate plane.

The ultimate solution to a system of equations is for the lines to intersect on a point such as question number one in question number four.

Question One:

Solve the equations for X and Y. The first equation is two X minus three Y equals negative twelve. The second equation is X minus two Y equals negative nine.

Answer One:

The answer is X equals three and Y equals six.

Steps to the answer:

Multiply the second equation by negative two.

This results in the equation of negative two X plus four Y equals eighteen.

Now add the first and second equation together.

Notice the two X of the first equation and the negative two X of the second equation will cancel.

Combining negative three Y in the first equation with four Y in the second equation results in Y.

Finally, combined negative twelve on the right side of the first equation with eighteen on the right side of the second equation to get six.

This results in the combination of the two equations to be Y equals six.

Now, substitute the value of six for variable Y into the first equation.

This results in the equation of two X minus three times six equals negative twelve.

Solve the equation for variable X to get X equals three.

Question Two:

Solve the equations for X and Y. The first equation is four X plus six Y equals ten. The second equation is two X plus three Y equals five.

Answer Two:

The answer is infinite solutions.

Steps to the answer:

Question number two has two equations and one is a multiple of the other.

Hence, both formulas graph the same line making the solution infinite.

Question Three:

Solve the equations for X and Y.

The first equation is X plus two Y equals five.

The second equation is X plus two Y equals seven.

Answer Three:

The answer is no solution.

Steps to the answer:

Question number three has the last possibility of the types of solutions.

If you graph the lines in question number three, you will find that they are parallel and do not cross. This system has no solution.

Question Four:

Solve the equations for X and Y. The first equation is two X minus three Y equals negative four.

The second equation is Y equals negative two X plus four.

Answer Four:

The answer is X equals one and a Y equals two.

Section Thirteen: Radicals

Simplify the following using the rules of radicals (rationalize denominators).

All variables represent positive numbers.

Think of the index as a door person. The index is also known as the root.

For example, the square root has an index of two. A cube root has an index of three.

The fourth root has an index of four.

If the index is a two, then two identical factors inside the radical sign become one factor outside of the radical sign.

Also, remember these properties: the n th root of A times the n th root of B equals the n th root of A times B .

The second property is the n th root of A over B equals the n th root of A over the n th root of B .

Question One:

(square root of eight) times (square root of ten).

Answer One:

The answer is four times the square root of five.

Steps to the answer:

First, rewrite (square root of eight) times (square root of ten) as the square root of eight times ten.

Next, write the prime factorization of eight and ten.

The prime factorization of eight is two times two times two.

The prime factorization of ten is two times five.

This results in the problem of the square root of two times two times two times two times five.

Since this is the square root, two identical factors inside of the radical sign become one factor outside of the radical sign.

This results in two times two times the square root of five.

The problem is simplified to get the answer of four times the square root of five.

Question Two:

The fourth root of the fraction eighty one over X to the fourth power.

Answer Two:

The answer is three over X .

Steps to the answer:

First, rewrite fourth root of the fraction eighty one over X to the fourth power as the fourth root of eighty one over the fourth root of X to the fourth power.

Next, write the prime factorization of eighty one and X to the fourth power.

The prime factorization of eighty one is three times three times three times three.

The prime factorization of X to the fourth power is X times X times X times X .

This results in the problem of the fourth root of three times three times three times three all over the fourth root of X times X times X times X .

Since this is the fourth root, four identical factors inside of the radical sign become one factor outside of the radical sign. This results in the answer of three over X .

Question Three:

The square root of the fraction four over three.

Answer Three:

The answer is two times the square root of three over three.

Steps to the answer:

First, rewrite the square root of the fraction four over three as the square root of four over the square root of three.

This results in two over the square root of three.

To rationalize the denominator multiply two over the square root of three by the fraction square root of three over square root of three.

This equals two times the square root of three over the square root of three times three.

Simplify the denominator of the fraction to get the square root of nine.

This results in the answer of two times the square root of three over three.

Question Four:

The square root of the fraction twelve over eighteen times the square root of the fraction fifteen over forty.

Answer Four:

The answer is one over two.

Steps to the answer:

First, rewrite square root of the fraction twelve over eighteen times the square root of the fraction fifteen over forty as the square root of twelve over eighteen times fifteen over forty.

Multiply the two fractions then simplify to get the square root of one over four.

Rewrite the square root of one over four as the square root of one over the square root of four.

This results in the answer of one over two.

Question Five:

The cube root of twenty four X to the third power Y to the six power.

Answer Five:

The answer is two X to the first power Y to the second power times the cube root of three.

Steps to the answer:

First, write the prime factorization of twenty four then the prime factorization of X to the third power and the prime factorization of Y to the sixth power.

The prime factorization of twenty four is two times two times two times three.

The prime factorization of X to the third power is X times X times X.

The prime factorization of Y to the sixth power is Y times Y times Y times Y times Y times Y.

This results in the problem being the cube root of two times two times two times three times X times X times X times Y times Y times Y times Y times Y times Y.

Since this is a cube root, three identical factors inside the radical sign become one factor out side of the radical sign.

This results in two times X times Y times Y times the cube root of three.

Simplifying gives the answer of two times X times Y to the second power times the cube root of three.

Question Six:

Two times the square root of eighteen minus five times the square root of thirty two plus seven times the square root of one hundred sixty two.

Answer Six:

The answer is forty nine times the square root of two.

Steps to the answer:

First, rewrite eighteen, thirty two, and one sixty two using prime factorization.

This results in the problem becoming two times the square root of (three times three times two) minus five times the square root of (two times two times two times two times two) plus seven times the square root of (two times nine times nine).

Since this is a square root, two identical factors inside the radical sign become one factor outside of the radical side.

This results in the problem becoming two times three times of the square root of two minus five times two times two times the square root of two plus seven times nine times the square root of two.

This equals six times the square root of two minus twenty times the square root of two plus sixty three times the square root of two.

Subtracting in adding the numbers in front of the square roots of two results in the answer of forty nine times the square root of two.

Question Seven:

The square root of three over (five minus the square root of three).

Answer Seven:

The answer is the fraction five times the square root of three plus three over twenty two.

Steps to the answer:

To rationalize the denominator multiply the square root of three over five minus the square root of three by the fraction five plus the square root of three all over five plus the square root of three.

Use the distributive property in the numerator to distribute the square root of three to the five and to the square root of three.

This results in the numerator being five times the square root of three plus three.

Use the distributive property twice in the denominator to distribute the five 2 D five in the square root of three and to distribute the minus square root of three to the five and the square root of three. This results in the denominator being twenty five minus three.

Simplifying the problem results in the answer of five times the square root of three plus three all over twenty two.

Question Eight:

(two times the square root of three plus five times the square root of two) times (three times the square root of three minus four times the square root of two).

Answer Eight:

The answer is negative twenty two plus seven times the square root of six.

Steps to the answer:

Use the F O I L technique which is the same as distributing twice to simplify this problem.

First, multiply two times the square root of three with three times the square root of three minus four times the square root of two which results in six times square root of nine minus eight times square root of six.

Then, multiply five time square root of two with three times square root of three and minus four times square root of two.

This results in fifteen times square root of six minus twenty times square root of four.

The problem is now six times square root of nine minus eight times square root of six plus fifteen times where root of six minus twenty square root of four.

Six times square root nine becomes eighteen because square room nine equals three and six times three equals eighteen.

The minus twenty times square root of four becomes minus forty because square root of four equals two and two times minus twenty becomes minus forty.

The problem is now eighteen minus eight times the square root of six plus fifteen times the square root of six minus forty.

Combine eighteen minus forty to get negative twenty two and combine negative eight times a square to six plus fifteen times the square root of six to get seven times the square root of six.

This results in the answer of negative twenty two plus seven times the square root of six.