

ACE THAT TEST!

ACE YOUR IBEW TEST WITH IPREP



Dear Future IBEW Apprentice,

You are about to start an exciting career as an electrician. But before that, you will have to pass some challenging recruitment steps.

The Electrical Training Alliance aptitude test, better known as the IBEW Electrical Aptitude Test is one of the toughest hurdles to get through; this is where iPrep.Online comes in.

For years, iPrep has been keeping track of the changes and adaptations taken first by the NJATC and then by the Electrical Training Alliance, in order to create a preparation course that is customized for the most recent version of the aptitude test.

iPrep

Ace That test!

What Can I Expect on the Electrical Aptitude Test?

The IBEW Electrical Aptitude Test is comprised of a total of 69 questions in two different sections:

TEST SECTION	NO. OF QUESTIONS	TIME
ALGEBRA & FUNCTIONS	33 QUESTIONS	46 MINUTES
READING COMPREHENSION	36 QUESTIONS	51 MINUTES

In total, you have an average of less than 90 seconds to answer each question. However, there is no need for you to answer all the questions because only the correct answers count. It is important to try to answer as many questions correctly as you can.



THE IPREP ADVANTAGE – DETAILED SOLUTIONS

At iPrep we believe in learning through practice. While our study guide teaches everything you need to know about the test, you will gain the best solving techniques by delving into our detailed, step-by-step solutions.

Aptitude Test Sample Questions – Solved!

You are probably familiar with the [official IBEW sample questions](#) offered by the Electrical Training Alliance. With iPrep, you will learn how to approach and solve each of these questions and more. Below is a collection of iPrep sample questions; each question is parallel to one of the official sample questions and is followed by a detailed solution, similar to the solutions you will encounter in the [iPrep IBEW Electrical Aptitude Test Preparation Course](#).

1. Algebra – Variables and the Order of Operations

Consider the following formula:

$$A = B + 3(C - 3)$$

If $A = 10$ and $B = 1$, what is the value of C ?

- 3
- 9
- 4
- 6

The correct answer is 6.

In order to solve this problem correctly, you need to remember the order of operations (PEMDAS):

1. Parentheses
2. Exponents
3. Multiplication/Division
4. Addition/Subtraction

In order to find a solution, you need to isolate C.

First step - placing the values of A and B:

$$A = B + 3(C - 3) \quad \text{Remember } A = 10; B = 1$$

$$10 = 1 + 3(C - 3)$$

Second step - removing the parentheses:

$$10 = 1 + 3(C - 3) \quad 3 \text{ is a factor of both } C \text{ and } -3$$

$$10 = 1 + 3C - 3 \cdot 3 \quad \text{Simplify and collect like terms}$$

$$10 = 3C + 1 - 9$$

Third step - isolating C and finding the solution:

$$10 = 3C - 8 \quad \text{Adding 8 to both sides}$$

$$10 + 8 = 3C$$

$$18 = 3C \quad \text{Divide by 3}$$

$$\mathbf{6 = C}$$

Remember - if you see a number that is written to the left of the parentheses with no sign between the number and the left bracket, then this number is a factor of the parentheses, which means it multiplies everything within the parentheses.

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- Algebra & Functions
- Reading Comprehension

”

2. Algebra – Simplifying Polynomials

Consider the following formula:

$$y = 2(2x + 1)(x - 1)$$

Which of the following formulas is equivalent to this one?

- $4x^2 - x - 1$
- $4x^2 - 2x - 2$
- $2x^2 - x - 1$
- $2x^2 - 2x - 2$

The correct answer is $4x^2 - 2x - 2$.

In order to solve this problem correctly, you need to make sure that you understand the notations and the order of operations:

1. The number 2 at the left is a factor of the product of binomials. You can either:
 - a. Multiply the binomials to find a polynomial and then multiply the outcome by the factor 2.
 - b. Remove the factor 2 by distributing it within **only one** of the binomials. If you multiply each of the binomials by 2, you will get a different, incorrect result.
2. While multiplying binomials, remember the FOIL method in order not to forget any of the elements of the product. FOIL is an acronym for First-Out-In-Last. This is a mnemonic device that will help you remember which elements should be multiplied in each product of binomials.

“

If you see a number that is written to the left of the parentheses with no sign between the number and the left bracket, then this number is a factor of the parentheses, which means it multiplies everything within the parentheses.

”

We will demonstrate both of these methods:

Method A: Multiply the binomials first:

$2(2x + 1)(x - 1) =$ Remember the FOIL method

$2(2x \cdot x + 1 \cdot x - 2x \cdot 1 + 1 \cdot (-1))$ Simplify - multiplication first

$2(2x^2 + x - 2x - 1)$ Collect like terms

$2(2x^2 - x - 1)$ Factor 2 inside the parentheses

$4x^2 - 2x - 2$

Method B: Multiply one of the binomials by 2 first:

$2(2x + 1)(x - 1) =$ Factoring 2 inside the left parentheses

$(4x + 2)(x - 1) =$ Multiply the binomials, remember the FOIL method

$4x \cdot x + 2 \cdot x - 1 \cdot 4x - 1 \cdot 2 =$ Simplify and collect like terms

$4x^2 + 2x - 4x - 2 =$

$4x^2 - 2x - 2$

3. Number Series

Consider the following pattern of numbers:

7 10 15 22 31

What is the next number in the pattern?

- 39
- 41
- 40
- 42

The correct answer is 42.

Explanation:

Look at the differences between the numbers and at the differences between the differences:

$$\begin{array}{cccccc} 7 & 10 & 15 & 22 & 31 & \\ & +3 & +5 & +7 & +9 & \\ & & +2 & +2 & +2 & \end{array}$$

The difference between each term is greater by two in every step. Therefore, the difference between the last displayed number of the series and the next number should be $9 + 2 = 11$

Therefore, the next number of the series is $31 + 11 = 42$

For learning purposes, calculate the values of the differences of the series if you had continued the series:

$$+3 \quad +5 \quad +7 \quad +9 \quad +11 \quad +13 \quad +15$$

Therefore, the next numbers of the series will be:

$$42 + 13 = 55$$

$$55 + 15 = 70$$

“

While multiplying binomials, remember the FOIL method in order not to forget any of the elements of the product.

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4. Functions - Analyzing Functions

Consider the following formula:

$$\mathbf{B + 12 = -6A}$$

Which of the following statements is true for this formula?

1. If A is greater than -6, B is positive.
2. If A is less than -2, B is positive.
3. If A is less than 2, B is positive.
4. If A is greater than -6, B is negative.

The correct answer is B.

All the answers refer to the value of B as a function of the value of A. To solve the problem systematically, you can find the value of A that is the tipping point. Values above this A will yield B-values with one sign and values below this A will yield B-values of the opposite sign.

To find the tipping point, you need to assume that $B = 0$ and place it in the formula:

$$B + 12 = -6A$$

$$0 + 12 = -6A$$

$$-6A = 12 \quad \text{divide both sides by } -6$$

$$\mathbf{A = -2}$$

This means that values in the range $A > -1$ will yield B values of one sign and values in the range $A < -1$ will yield B values of the opposite sign. You only need to check one A value to understand which one is which. Let's choose $A=0$.

$$B + 12 = -6A$$

$$B + 12 = -6 \cdot 0$$

$$B + 12 = 0$$

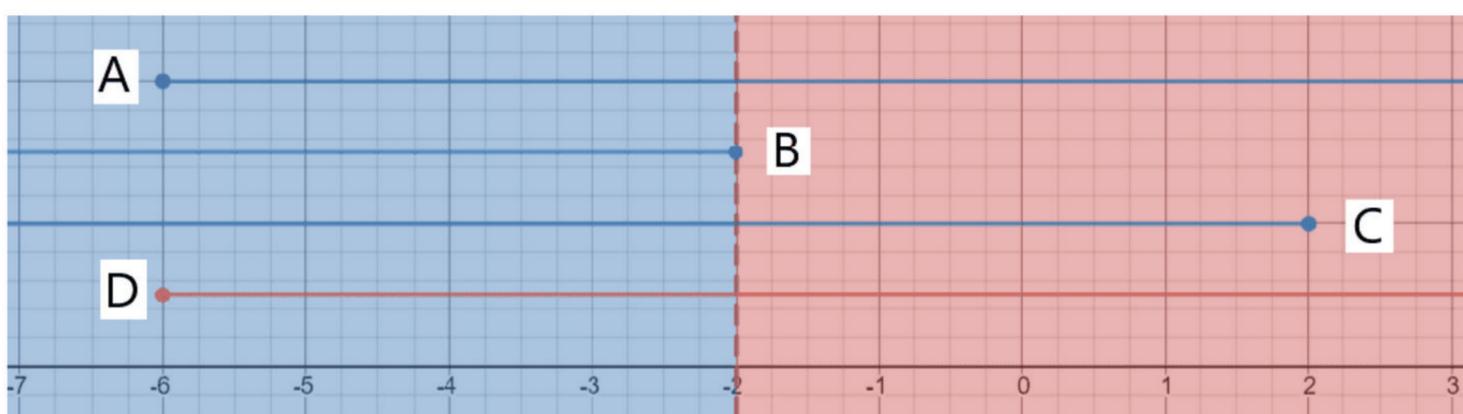
$$\mathbf{B = -12}$$

B is negative. According to the above, you can get to the conclusion:

For any A in the range $A > -2$, B is negative and for any A in the range $A < -2$, B is positive.

To check which answer is correct, you can draw a graph of the above conclusion and the four answers and then check which answer completely overlaps with the conclusion.

In the image below, the background is divided according to the tipping point ($A = -2$), the blue area indicates positive B values, and the red area indicates negative B values. The lines depict the range proposed by the answers and their respective B values. You can see that only graph B is in accordance with both the range and the color of the general conclusion.



5. Functions – Analyzing Function Information

Consider the following table:

x	y
-10	5
-6	3
-2	1
-1	0.5
2	-1

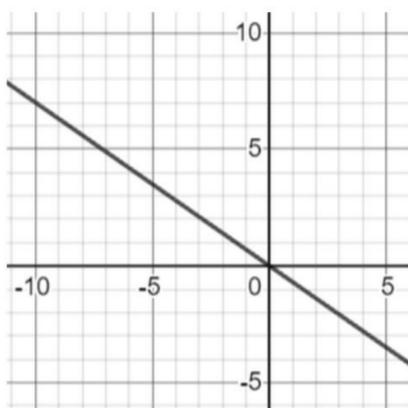
Which of the following options represents the same relationship as this table?

A.

x	y
100	-50
50	-10
0	0
-50	10
-100	50

B. $-x = 2y$

C.



D. There is no pattern to the values presented in the table

The correct answer is B.

Examine the values in the table. You may notice that the absolute value of x is always two times y and the signs are always different. This observation disqualifies option D.

Making a rule out of these observations:

“the absolute value of x is always two times of y ” $\rightarrow x = 2y$

“the signs are always different” $\rightarrow x = -2y$ or equivalently **$-x = 2y$**

The latter is exactly option B, thus it is the correct answer. You can try placing the values of the table in the function. It is a perfect fit, which means that B is the correct answer.

Why A and C are incorrect?

In table A, some values go according to the same pattern as the original table but some values do not (e.g. $x=50$ and $y= -10$ may be a value in the function **$-x = 5y$**)

Graph C depicts a linear function. For every linear function, in order to eliminate it from being the correct answer, it is enough to find one value in the table that does not stand exactly on the line. In this case, you can match several x values and realize that if placed in the graph, they would be above/beneath the line.

6-7. Reading Comprehension

There is meaning behind certain colors. Let's examine the meaning behind two colors that seem to be used quite a bit—red and black. Red is generally associated with energy, power, strength, and determination. Red is commonly used in many sports uniforms because of all the above-mentioned ideas associated with it.

Then there is black, which is associated with power. There are other things black is associated with such as evil, death, and elegance, and in sports, the focus is on its meaning of power. These two colors, red and black, are common in almost every NFL team's uniform. Sixteen out of the thirty-two teams in the NFL have these colors in their uniform. That is very telling considering the meanings of these two colors.

Blue is another common color for a uniform. It symbolizes confidence, wisdom, and intelligence. Wisdom and intelligence are not the first words that come to mind when thinking of a sports team. Considering that, people may conjecture that blue should not be used for uniforms.

However, anyone who has ever played a sport knows it takes more than muscles to win a game. Blue has the second-highest prevalence in NFL uniforms. Thirteen out of the thirty-two teams use some form of blue in their uniform.

1. *Black is a common color for sports uniforms because it reflects positively on the _____ of the team.*

- A. Elegance
- B. Strength
- C. Power
- D. Evil

The correct answer is C.

The second paragraph focuses on the traits associated with the red and black colors. You should look for the traits associated with black to answer the questions. Of the four answers, three are associated with black—elegance, power, and evil. However, the paragraph emphasizes that in the context of sports, black is chosen as a uniform color for its association with “power.” “Power” is also associated with red. If you are not a careful reader, it might lead you to eliminate it from being the correct answer.

Tip: As you may assume that colors should reflect on positive, sports-related traits, answers B and C may strike you as better candidates for the correct answer. If you reach such a conclusion, it might be sufficient to search for those specific words in the text and to try to affirm or contradict them as the correct answer.

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The iPrep course provides an unparalleled curriculum that will get you as ready as possible for test day.

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2. ***What is true according to the passage?***

- A. Blue is the second-most prevalent color in sports uniforms.
- B. Blue is not the most prevalent color in sports uniforms.
- C. Blue is the most prevalent color in NFL uniforms.
- D. Some colors are more prevalent than blue in NFL uniforms.

The correct answer is D.

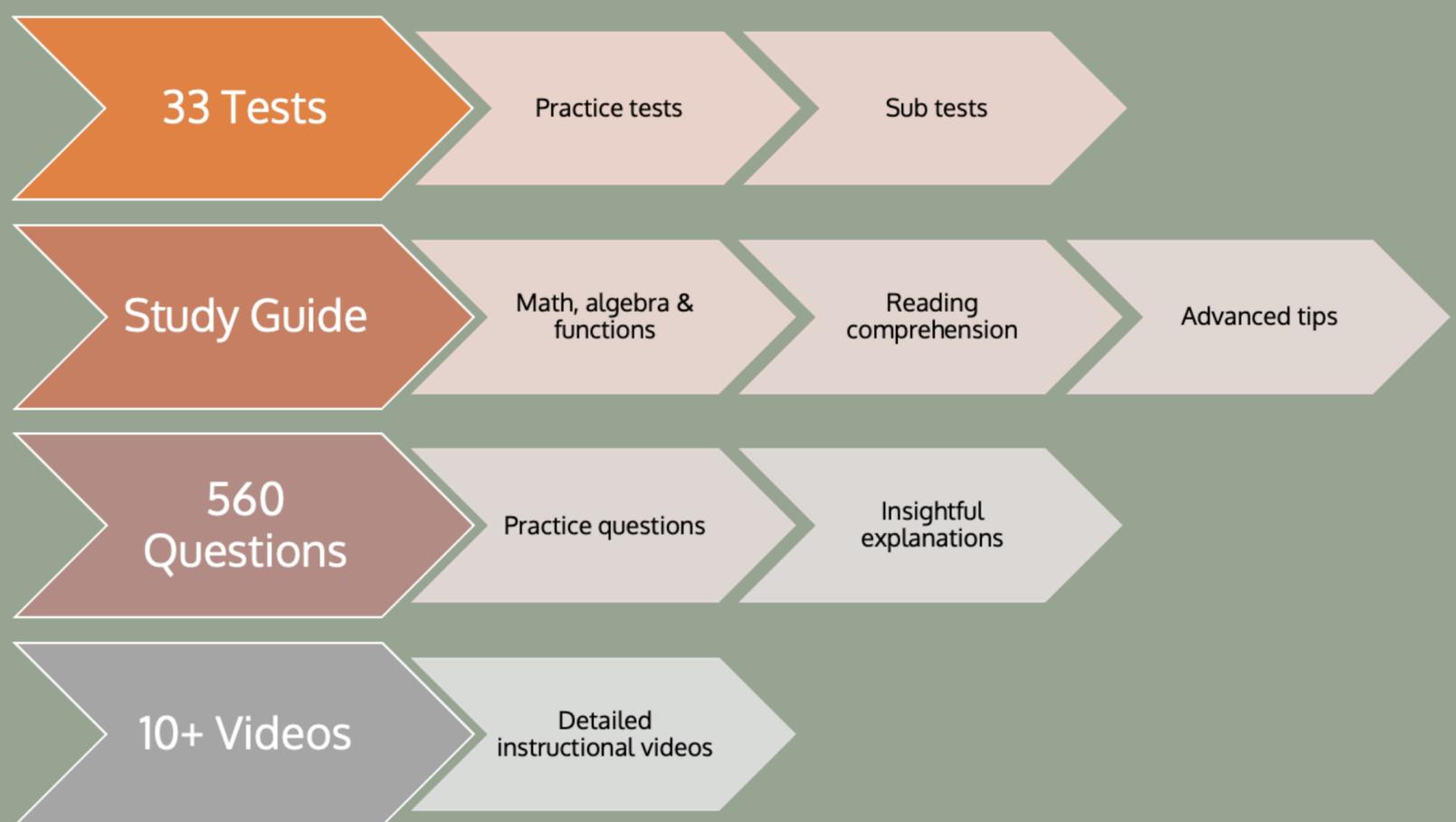
The passage states that “Blue has the second-highest prevalence in NFL uniforms.” This means that there is at least one color with a higher prevalence in NFL uniforms. “Some” may refer to any number of items higher than zero.

Answers A and B are incorrect because they refer to sports in general and not specifically to the NFL. Answer C is incorrect as it directly contradicts the statement of the passage.



HOW CAN IPREP HELP YOU PREPARE FOR THE APTITUDE TEST?

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