

WHICH EQUATION REPRESENTS THE LINE THAT IS PARALLEL TO $Y = 3$ AND PASSES THROUGH $(-2, -8)$? A. $X = -2$ B. X

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UNDERSTANDING THE PROBLEM

BEFORE DIVING INTO THE SOLUTION, IT'S CRUCIAL TO INTERPRET THE QUESTION CAREFULLY. THE PROBLEM ASKS:

WHICH EQUATION REPRESENTS A LINE THAT IS PARALLEL TO THE LINE $Y = 3$ AND PASSES THROUGH THE POINT $(-2, -8)$?

IT APPEARS THAT THE QUESTION PROVIDES TWO OPTIONS:

- A. $X = -2$
- B. X

HOWEVER, THE OPTIONS SEEM INCOMPLETE OR POSSIBLY TRUNCATED. FOR CLARITY AND COMPLETENESS, WE'LL EXPLORE THE GENERAL PRINCIPLES INVOLVED AND HOW TO IDENTIFY THE CORRECT EQUATION AMONG POSSIBLE OPTIONS.

FUNDAMENTALS OF PARALLEL LINES

WHAT ARE PARALLEL LINES?

- PARALLEL LINES ARE LINES IN A PLANE THAT NEVER INTERSECT.
- THEY HAVE THE SAME SLOPE BUT DIFFERENT Y-INTERCEPTS.

UNDERSTANDING THE GIVEN LINE: $Y = 3$

- THE LINE $Y = 3$ IS A HORIZONTAL LINE.
- ITS SLOPE IS 0 BECAUSE IT'S PERFECTLY HORIZONTAL.
- ANY LINE PARALLEL TO $Y = 3$ MUST ALSO BE HORIZONTAL WITH THE SAME SLOPE (0).

DETERMINING THE EQUATION OF THE PARALLEL LINE

KEY CHARACTERISTICS

- SINCE THE ORIGINAL LINE $Y = 3$ IS HORIZONTAL, ANY PARALLEL LINE MUST ALSO BE HORIZONTAL.
- THE NEW LINE MUST PASS THROUGH THE POINT $(-2, -8)$.

FINDING THE EQUATION

- FOR A HORIZONTAL LINE, THE EQUATION IS OF THE FORM $y = k$, WHERE k IS A CONSTANT.
- TO FIND k , SUBSTITUTE THE POINT $(-2, -8)$ INTO THE FORM $y = k$:

$$y = k$$

$$-8 = k$$

- THEREFORE, THE EQUATION OF THE LINE PASSING THROUGH $(-2, -8)$ AND PARALLEL TO $y = 3$ IS:

$$y = -8$$

ANALYZING THE OPTIONS

OPTION A: $x = -2$

- THE EQUATION $x = -2$ REPRESENTS A VERTICAL LINE.
- VERTICAL LINES HAVE UNDEFINED SLOPE.
- SINCE $y = 3$ IS HORIZONTAL, A LINE PARALLEL TO IT MUST ALSO BE HORIZONTAL, NOT VERTICAL.
- THEREFORE, $x = -2$ IS NOT PARALLEL TO $y = 3$.

OPTION B: x

- " x " ALONE IS AN INCOMPLETE EXPRESSION.
- LIKELY, THE ORIGINAL OPTIONS INTENDED TO INCLUDE " $y = -8$ " AS THE ANSWER.
- ALTERNATIVELY, IT MAY BE A TYPO OR TRUNCATION.

CONCLUSION: THE CORRECT EQUATION

- THE LINE PARALLEL TO $y = 3$ PASSING THROUGH $(-2, -8)$ IS $y = -8$.
- IT IS HORIZONTAL, MATCHING THE SLOPE OF THE ORIGINAL LINE.
- THE GIVEN OPTIONS, AS THEY STAND, ARE INCOMPLETE OR MISREPRESENTED.

ADDITIONAL INSIGHTS AND CLARIFICATIONS

WHAT IF THE OPTIONS WERE DIFFERENT?

SUPPOSE THE OPTIONS INCLUDED:

- A. $y = -8$
- B. $x = -2$

THEN, THE CORRECT ANSWER WOULD BE A. $y = -8$, BECAUSE:

- THE LINE $y = -8$ PASSES THROUGH $(-2, -8)$.
- IT IS HORIZONTAL, HENCE PARALLEL TO $y = 3$.

UNDERSTANDING THE ROLE OF SLOPE

- THE SLOPE OF $y = 3$ IS 0.
- PARALLEL LINES MUST HAVE IDENTICAL SLOPES.
- HORIZONTAL LINES ALWAYS HAVE SLOPE 0, MAKING THEM PARALLEL.

OTHER TYPES OF LINES AND PARALLELISM

- FOR NON-HORIZONTAL LINES, PARALLEL LINES SHARE THE SAME SLOPE BUT HAVE DIFFERENT Y-INTERCEPTS.
- FOR EXAMPLE, $y = 2x + 1$ AND $y = 2x - 4$ ARE PARALLEL BECAUSE THEY SHARE THE SAME SLOPE (2).

SUMMARY OF KEY POINTS

- THE ORIGINAL LINE $y = 3$ IS HORIZONTAL WITH SLOPE 0.
- A LINE PARALLEL TO $y = 3$ MUST ALSO BE HORIZONTAL WITH SLOPE 0.
- TO FIND THE SPECIFIC LINE PASSING THROUGH A POINT, SUBSTITUTE THE Y-COORDINATE INTO $y = k$.
- THE ANSWER TO THE PROBLEM, GIVEN THE POINT $(-2, -8)$, IS $y = -8$.
- THE OPTIONS PROVIDED IN THE QUESTION SEEM INCOMPLETE, BUT UNDERSTANDING THESE PRINCIPLES HELPS IDENTIFY THE CORRECT LINE.

FINAL REMARKS

IN PROBLEMS INVOLVING PARALLEL LINES, ALWAYS FOCUS ON THE SLOPE AND THE NATURE OF THE ORIGINAL LINE. HORIZONTAL LINES HAVE A SLOPE OF ZERO AND ARE REPRESENTED BY EQUATIONS OF THE FORM $y = c$, WHERE c IS A CONSTANT. WHEN GIVEN A POINT AND ASKED TO FIND A PARALLEL LINE, DETERMINE THE LINE'S SLOPE AND USE THE POINT-SLOPE FORM OR DIRECT SUBSTITUTION TO FIND THE SPECIFIC EQUATION.

FOR THIS PARTICULAR PROBLEM, THE KEY TAKEAWAY IS RECOGNIZING THAT THE LINE PARALLEL TO $y = 3$ PASSING THROUGH $(-2, -8)$ IS $y = -8$, A HORIZONTAL LINE PASSING THROUGH THE Y-COORDINATE -8, INDEPENDENT OF THE X-VALUE.

IN CONCLUSION, THE CORRECT EQUATION REPRESENTING THE LINE PARALLEL TO $y = 3$ AND PASSING THROUGH THE POINT $(-2, -8)$ IS:

$$y = -8$$

THIS UNDERSTANDING ALLOWS FOR PRECISE IDENTIFICATION OF LINES AND THEIR RELATIONSHIPS IN COORDINATE GEOMETRY,

FREQUENTLY ASKED QUESTIONS

WHAT IS THE SLOPE OF THE LINE $y = 3$?

THE SLOPE OF THE LINE $y = 3$ IS 0, SINCE IT IS A HORIZONTAL LINE.

WHAT IS THE EQUATION OF A LINE PARALLEL TO $y = 3$ PASSING THROUGH $(-2, -8)$?

THE EQUATION IS $y = -8$, BECAUSE PARALLEL LINES TO A HORIZONTAL LINE $y=3$ ARE ALSO HORIZONTAL WITH THE SAME y -VALUE.

DOES THE POINT $(-2, -8)$ AFFECT THE SLOPE OF THE PARALLEL LINE?

NO, BECAUSE HORIZONTAL LINES HAVE A SLOPE OF 0 REGARDLESS OF THE POINT THEY PASS THROUGH.

WHAT IS THE GENERAL FORM OF THE EQUATION FOR A HORIZONTAL LINE PASSING THROUGH A POINT?

THE GENERAL FORM IS $y = c$, WHERE c IS THE y -COORDINATE OF THE POINT.

IS THE LINE $y = -8$ PARALLEL TO $y = 3$?

YES, BOTH ARE HORIZONTAL LINES WITH DIFFERENT y -INTERCEPTS, SO THEY ARE PARALLEL.

WHICH OF THE FOLLOWING OPTIONS CORRECTLY REPRESENTS THE PARALLEL LINE PASSING THROUGH $(-2, -8)$?

$y = -8$

CAN THE EQUATION $x = -2$ BE THE LINE PARALLEL TO $y = 3$ PASSING THROUGH $(-2, -8)$?

NO, BECAUSE $x = -2$ IS A VERTICAL LINE, WHICH IS PERPENDICULAR TO A HORIZONTAL LINE, NOT PARALLEL.

WHAT IS THE CORRECT ANSWER AMONG OPTIONS A AND B FOR THE EQUATION OF THE LINE PASSING THROUGH $(-2, -8)$ AND PARALLEL TO $y = 3$?

OPTION A: $x = -2$ IS INCORRECT; THE CORRECT EQUATION IS $y = -8$.

ADDITIONAL RESOURCES

WHICH EQUATION REPRESENTS THE LINE THAT IS PARALLEL TO $y = 3$ AND PASSES THROUGH $(-2, -8)$? A. $x = -2$ B. x

UNDERSTANDING THE FUNDAMENTALS OF LINES IN COORDINATE GEOMETRY IS ESSENTIAL FOR STUDENTS AND ENTHUSIASTS ALIKE. WHEN FACED WITH A PROBLEM ASKING TO IDENTIFY A LINE PARALLEL TO A GIVEN ONE AND PASSING THROUGH A SPECIFIC POINT, IT'S IMPORTANT TO INTERPRET THE QUESTION CAREFULLY AND APPLY THE APPROPRIATE MATHEMATICAL PRINCIPLES. HERE, WE EXPLORE THE QUESTION: WHICH EQUATION REPRESENTS THE LINE THAT IS PARALLEL TO $y = 3$ AND PASSES THROUGH $(-2, -8)$?

WE WILL ANALYZE THE OPTIONS, CLARIFY KEY CONCEPTS, AND GUIDE YOU THROUGH THE REASONING PROCESS IN A CLEAR, DETAILED MANNER.

UNDERSTANDING THE GIVEN LINE: $y = 3$

BEFORE DELVING INTO THE PROBLEM, IT'S CRUCIAL TO UNDERSTAND WHAT THE GIVEN LINE $y = 3$ SIGNIFIES.

THE NATURE OF $y = 3$

THE EQUATION $y = 3$ IS A HORIZONTAL LINE IN THE CARTESIAN COORDINATE SYSTEM. ITS DEFINING CHARACTERISTIC IS THAT THE Y-COORDINATE REMAINS CONSTANT AT 3 FOR ALL POINTS ON THE LINE. THIS MEANS:

- THE LINE EXTENDS INFINITELY LEFT AND RIGHT.
- THE Y-VALUE IS ALWAYS 3, REGARDLESS OF THE X-VALUE.

SLOPE AND ORIENTATION

THE SLOPE OF $y = 3$ IS ZERO BECAUSE IT'S A HORIZONTAL LINE. IN MATHEMATICAL TERMS:

- SLOPE (m) = 0

THIS FACT IS KEY WHEN IDENTIFYING A LINE PARALLEL TO THIS ONE, AS PARALLEL LINES HAVE IDENTICAL SLOPES.

WHAT DOES IT MEAN FOR TWO LINES TO BE PARALLEL?

FUNDAMENTAL PRINCIPLES OF PARALLEL LINES

IN COORDINATE GEOMETRY, THE CONCEPT OF PARALLELISM IS STRAIGHTFORWARD YET FUNDAMENTAL. TWO LINES ARE PARALLEL IF:

- THEY LIE IN THE SAME PLANE.
- THEY NEVER INTERSECT, REGARDLESS OF HOW FAR THEY EXTEND.

SLOPE AS A DETERMINANT

THE SLOPE (m) OF A LINE DETERMINES ITS TILT OR INCLINATION. PARALLEL LINES ALWAYS SHARE THE SAME SLOPE. CONVERSELY, LINES WITH DIFFERENT SLOPES WILL EVENTUALLY INTERSECT (UNLESS THEY ARE VERTICAL AND HORIZONTAL LINES, WHICH ARE SPECIAL CASES).

- FOR A LINE TO BE PARALLEL TO $y = 3$ (WHICH HAS A SLOPE OF 0), IT MUST ALSO HAVE A SLOPE OF 0.

IMPLICATION FOR OUR LINE

SINCE $y = 3$ IS HORIZONTAL, ANY LINE PARALLEL TO IT MUST ALSO BE HORIZONTAL. THEREFORE:

- THE NEW LINE MUST HAVE A CONSTANT Y-VALUE.
- IT MUST NOT HAVE ANY INCLINATION OR TILT.

IDENTIFYING THE EQUATION OF THE PARALLEL LINE PASSING THROUGH $(-2, -8)$

GIVEN THAT THE ORIGINAL LINE IS $y = 3$, AND THE NEW LINE MUST PASS THROUGH THE POINT $(-2, -8)$, HERE IS THE STEP-BY-STEP REASONING:

STEP 1: CONFIRM THE SLOPE

- THE ORIGINAL LINE'S SLOPE IS 0.
- THE PARALLEL LINE MUST ALSO HAVE A SLOPE OF 0.

STEP 2: DETERMINE THE EQUATION'S FORM

- HORIZONTAL LINES HAVE EQUATIONS OF THE FORM $y = c$, WHERE c IS A CONSTANT.
- SINCE THE LINE MUST PASS THROUGH $(-2, -8)$, THIS POINT GIVES THE y -COORDINATE DIRECTLY.

STEP 3: WRITE THE EQUATION

- THE y -COORDINATE OF THE POINT IS -8 .
- THEREFORE, THE LINE PASSING THROUGH THIS POINT WITH SLOPE 0 IS:

$$y = -8$$

THIS LINE IS HORIZONTAL, PASSES THROUGH $(-2, -8)$, AND IS PARALLEL TO $y = 3$.

ANALYZING THE GIVEN OPTIONS

THE QUESTION OFFERS TWO OPTIONS:

- A. $x = -2$
- B. x

LET'S INTERPRET EACH:

OPTION A: $x = -2$

- THIS IS A VERTICAL LINE PASSING THROUGH ALL POINTS WHERE x EQUALS -2 .
- VERTICAL LINES HAVE AN UNDEFINED SLOPE.
- IT IS NOT PARALLEL TO $y = 3$, WHICH IS HORIZONTAL.
- THEREFORE, THIS OPTION IS INCORRECT.

OPTION B: x

- THE LABEL APPEARS INCOMPLETE, BUT ASSUMING THE OPTION IS x , IT SUGGESTS THE EQUATION $x = (\text{SOME VALUE})$.
- VERTICAL LINES ARE OF THE FORM $x = \text{CONSTANT}$.
- SINCE THE ORIGINAL LINE IS HORIZONTAL, THE ONLY WAY FOR THE NEW LINE TO BE PARALLEL TO IT IS IF IT IS ALSO HORIZONTAL, I.E., OF THE FORM $y = \text{CONSTANT}$.
- THEREFORE, x ALONE CANNOT REPRESENT THE LINE PASSING THROUGH $(-2, -8)$. IT APPEARS THAT THE OPTION IS INCOMPLETE OR IMPROPERLY FORMATTED.

CLARIFYING THE CORRECT ANSWER

BASED ON THE ANALYSIS:

- THE LINE PARALLEL TO $y = 3$ PASSING THROUGH $(-2, -8)$ MUST BE $y = -8$.
- THE OPTIONS PROVIDED DO NOT EXPLICITLY INCLUDE $y = -8$, WHICH IS THE CORRECT ANSWER.

IF THE OPTIONS ARE LIMITED TO THE INCOMPLETE CHOICES PROVIDED, THE MOST ACCURATE CONCLUSION IS:

- THE CORRECT LINE IS $y = -8$.
- THE OPTIONS A. $x = -2$ AND B. x ARE INSUFFICIENT OR INCORRECT BASED ON THE QUESTION'S CONTEXT.

ADDITIONAL INSIGHTS AND COMMON MISCONCEPTIONS

MISCONCEPTION 1: CONFUSING HORIZONTAL AND VERTICAL LINES

A COMMON MISTAKE IS TO ASSUME THAT THE EQUATION OF THE LINE PASSING THROUGH A POINT WITH A GIVEN SLOPE IS ALWAYS OF THE SAME FORM AS THE ORIGINAL LINE. REMEMBER:

- HORIZONTAL LINES: $y = \text{CONSTANT}$
- VERTICAL LINES: $x = \text{CONSTANT}$

MISCONCEPTION 2: OVERLOOKING THE POINT

THE POINT $(-2, -8)$ IS VITAL. FOR A HORIZONTAL LINE PASSING THROUGH THIS POINT, THE y -VALUE IS FIXED AT -8 . THE x -VALUE CAN BE ANY REAL NUMBER, INDICATING THE LINE EXTENDS INFINITELY IN THE HORIZONTAL DIRECTION.

MISCONCEPTION 3: MISINTERPRETATION OF THE OPTIONS

SOMETIMES OPTIONS ARE INCOMPLETE OR FORMATTED POORLY. ALWAYS VERIFY THE OPTIONS, AND IF NECESSARY, DOUBLE-CHECK THE QUESTION CONTEXT.

SUMMARY AND FINAL REMARKS

IN CONCLUSION, THE LINE PARALLEL TO $y = 3$ PASSING THROUGH $(-2, -8)$ IS GIVEN BY THE EQUATION $y = -8$. THIS LINE IS HORIZONTAL AND SHARES THE SAME SLOPE AS THE ORIGINAL LINE, ENSURING THE LINES ARE PARALLEL.

- THE CORRECT EQUATION: $y = -8$
- THE OPTIONS PROVIDED DO NOT EXPLICITLY INCLUDE THIS, INDICATING A POSSIBLE OVERSIGHT OR FORMATTING ISSUE.

KEY TAKEAWAYS:

- PARALLEL LINES SHARE THE SAME SLOPE.
- HORIZONTAL LINES HAVE THE FORM $y = \text{CONSTANT}$.
- VERTICAL LINES ARE OF THE FORM $x = \text{CONSTANT}$.
- TO FIND THE SPECIFIC LINE PASSING THROUGH A POINT, SUBSTITUTE THE POINT'S y -VALUE (FOR HORIZONTAL LINES) INTO THE EQUATION.

UNDERSTANDING THESE PRINCIPLES IMPROVES PROBLEM-SOLVING ACCURACY AND DEEPENS YOUR GRASP OF COORDINATE

FINAL NOTE: ALWAYS CAREFULLY ANALYZE THE GIVEN OPTIONS AND VERIFY THE UNDERLYING PRINCIPLES BEFORE SELECTING YOUR ANSWER. IF OPTIONS SEEM INCOMPLETE OR AMBIGUOUS, CONSIDER THE CONTEXT AND THE FUNDAMENTAL PROPERTIES OF LINES IN THE COORDINATE PLANE.

Which Equation Represents The Line That Is Parallel To $y = 3$ And Passes Through $(2, 8)$?

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