ACELLUS - SPECIAL LESSON

"Ski Slopes on Mount Intercept"

DIRECTIONS

In this activity, you are a skier on a mountain called Mount Intercept. You notice that the more difficult a route on the mountain, the higher the slope. You also notice that the higher you climb the mountain in altitude, the greater your y-intercept. Finally, you see that going uphill yields a positive slope while skiing downhill yields a negative slope.

Utilizing graphs and equations, determine what is happening on your skiing trip on Mount Intercept.

EXAMPLE PROBLEM

You go skiing on one route with an equation $y = -2x + 5$ and then immediately go to a route with an equation $y = -4x + 3$. Describe the difference between the two routes.

Step 1: Determine the slope of the two equations (routes). The first equation has a slope of -2 while the second equation has a slope of -4. This is because the slope is the coefficient of x when an equation is in slope-intercept form, $y = mx + b$, where m is the slope.

Step 2: Determine which slope has a larger absolute value. Absolute value is the distance from zero, so -4 is further away from zero than -2. This means the second equation has a steeper slope.

Step 3: Determine the y-intercept of both equations (routes). The first equation has a y-intercept of 5 while the second equation has a y-intercept of 3. The larger y-intercept indicates a higher placement on the graph.

Step 4: Put both pieces together to form a coherent comparison of the two routes. The first route ($y = -2x + 5$) has a flatter slope than the second route ($y = -4x + 3$) and also has a higher y-intercept. In this skiing application, it means that the first route is higher up Mount Intercept.

LIVEWORKSHEETS

"Ski Slopes on Mount Intercept"

1.) You go skiing on one route with an equation $y = 2x + 4$ and then immediately go to a route with an equation $y = 4x + 1$. Which of the following responses best describes your routes?

A: Your second route was steeper than your first, and the second route was higher up the mountain.

B: Your first route was positive (uphill), but your second route was negative (downhill).

C: Your first route was steeper than your second, and both were positive (uphill).

D: Your first route was flatter than your second, and your first route began at a higher point than your second.

2.) You are at the very top of the mountain and are given two choices for routes to the bottom. The first route has an equation $y = -2x + 10$, and the second route has an equation $y = -5x + 10$. Which of the two routes presents the steepest journey down the mountain?

A: Both are the same because both start at the top of the mountain.

B: The first route is the steepest.

C: The second route is the steepest.

D: Both routes are going uphill because the slopes are positive 10.

3.) What would happen if you subtracted 2 from the slope and added 3 to the y-intercept for the following equation? $y = -x + 2$

A: The slope would become more negative and steeper while the y-intercept would get larger and higher up Mount Intercept.

B: The slope would become more positive and flatter while the y-intercept would get larger and higher up Mount Intercept.

C: The slope would be unchanged while the y-intercept would get smaller and further down Mount Intercept.

D: The slope would become more negative and steeper while the y-intercept would be unchanged.

"Ski Slopes on Mount Intercept" cont.

4.) Which of the following equations would you recommend for a novice skier?
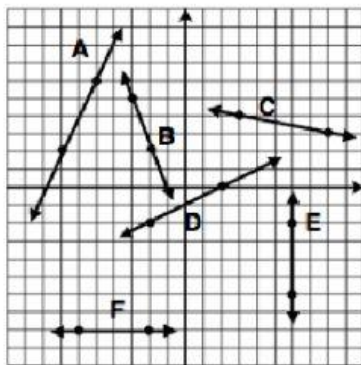
A: $y = -5x + 2$ **B:** $y = -x + 2$

C: $y = -3x + 2$ **D:** $y = -2x + 2$

5.) Which of the following routes (A – F) has the steepest slope? (Note, route E does not count because vertical lines have undefined slopes.)

A: Route A

B: Route B

C: Route C

D: Route D

F: Route F

LIVEWORKSHEETS

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Grading Rubric

TRAITS	1 - INADEQUATE	2 - MARGINAL	3 - Satisfactory	4 - Proficient
Strategy/Procedures	Does not use any strategy, or uses the wrong strategy to solve the problem, resulting in an incorrect answer	Uses correct strategy to solve the problem, but makes a slight math error	Uses a correct strategy to solve the problem	Uses a correct and efficient strategy to solve the problem
Mathematical Concepts	Shows no understanding of the concepts needed to solve the problem, resulting in an incorrect answer	Shows some understanding of the concepts needed to solve the problem, but makes a slight math error	Shows good understanding of the concepts needed to solve the problem	Shows complete understanding of the concepts needed to solve the problem
Mathematical Terminology and Symbols	Mathematical and/or terminology symbols are used incorrectly	Mathematical and/or terminology symbols are used sloppily, making it difficult to see what was done	Correct mathematical and/or terminology symbols are used	Advanced, correct mathematical and/or terminology symbols are used
Neatness and Organization	The work is very sloppy and unorganized	The work is fairly organized, but is difficult to read	The work is neat and organized	The work is neat, detailed, and organized
Explanation	The explanation is difficult to understand and is missing several important components	The explanation includes critical components, but is difficult to understand	The explanation is correct and makes sense	The explanation is clear, correct, and includes useful details