

Comparing Functions

Name: _____

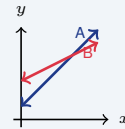
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Quick Review and Helpful Hints

To compare two functions, look at their *rate of change* (slope) and *starting value* (*y*-intercept). Functions may be given as equations, tables, or graphs – find each one's slope and intercept, then compare. A bigger slope rises faster.

▷ **Example:** Function A: $y = 2x + 1$. Function B goes through $(0, 3)$ and $(1, 4)$. Which has the greater slope? **Work:** A's slope is 2. B's slope = $\frac{4-3}{1-0} = 1$. Since $2 > 1$, A is steeper. ★ **Answer:** Function A



Compare slopes and intercepts.

◆ Practice Problems

Answer each comparison.

- | | |
|--|--|
| 1. Greater slope: $y = 3x + 1$ or $y = 2x + 5$? _____ | 8. Faster increase: $y = 2x$ or $y = 10x$? _____ |
| 2. Greater <i>y</i> -intercept: $y = 2x + 4$ or $y = 2x - 1$? _____ | 9. Greater slope: $y = x + 9$ or $y = 4x$? _____ |
| 3. Slope of $y = 5x - 2$ _____ | 10. <i>y</i> -intercept of a line through $(0, 7)$ _____ |
| 4. <i>y</i> -intercept of $y = 5x - 2$ _____ | 11. Slope of a horizontal line _____ |
| 5. Slope from $(0, 1), (1, 4)$ _____ | 12. Greater at $x = 1$: $y = 2x + 1$ or $y = x + 5$? _____ |
| 6. <i>y</i> -intercept from $(0, 1), (1, 4)$ _____ | 13. Slope from table $x: 0, 1, y: 2, 5$ _____ |
| 7. Steeper: slope 4 or slope -6 ? _____ | 14. Which increases: $y = -2x + 3$ or $y = 2x + 3$? _____ |

◆ Word Problems

15. Plan A charges \$2 per song; Plan B charges \$1.50 per song. Which has the lower rate? _____
16. Car A travels 50 mph and Car B travels 65 mph. Which has the greater rate? _____
17. Savings $y = 10x + 5$ vs. $y = 8x + 20$. Which starts higher (greater *y*-intercept)? _____
18. At $x = 2$, which is larger: $y = 3x$ or $y = x + 5$? _____



Answer Keys

1. $y = 3x + 1$

2. $y = 2x + 4$

3. 5

4. -2

5. 3

6. 1

7. slope -6

8. $y = 10x$

9. $y = 4x$

10. 7

11. 0

12. $y = x + 5$

13. 3

14. $y = 2x + 3$

15. Plan B

16. Car B

17. $y = 8x + 20$

18. $y = x + 5$

Step-by-Step Explanations

1. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Compare slopes 3 and 2: $y = 3x + 1$ is steeper. So the final answer is $y = 3x + 1$.

2. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Compare +4 and -1: $y = 2x + 4$ is higher. So the final answer is $y = 2x + 4$.

3. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The number with x is the slope: 5. So the final answer is 5.

4. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The constant is the y -intercept: -2. So the final answer is -2.

5. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Slope = $\frac{4-1}{1-0} = 3$. So the final answer is 3.

6. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is At $x = 0$, $y = 1$, so $b = 1$. So the final answer is 1.

7. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Steepness uses size: $|-6| = 6 > 4$, so slope -6. So the final answer is slope -6.

8. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Bigger slope rises faster: $y = 10x$. So the final answer is $y = 10x$.

9. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Slopes 1 vs. 4: $y = 4x$ is greater. So the final answer is $y = 4x$.

10. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The point $(0, 7)$ gives $b = 7$. So the final answer is 7.

11. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A horizontal line has slope 0. So the final answer is 0.

12. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is At $x = 1$: 3 vs. 6, so $y = x + 5$. So the final answer is $y = x + 5$.

13. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Slope = $\frac{5-2}{1-0} = 3$. So the final answer is 3.

14. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Positive slope increases: $y = 2x + 3$. So the final answer is $y = 2x + 3$.

15. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is \$1.50 < \$2, so Plan B has the lower rate. So the final answer is Plan B.

16. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $65 > 50$, so Car B. So the final answer is Car B.

17. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Compare 5 and 20: $y = 8x + 20$ starts higher. So the final answer is $y = 8x + 20$.

18. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is At $x = 2$: 6 vs. 7, so $y = x + 5$. So the final answer is $y = x + 5$.



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