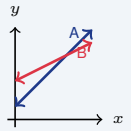
Comparing Functions

Name: _____	Date: _____	Score: _____ / 18

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 $y = 2x + 5$? _____

2. Greater y-intercept: $y = 2x + 4$ or $y = 2x - 1$? _____

3. Slope of $y = 5x - 2$ _____

4. y-intercept of $y = 5x - 2$ _____

5. Slope from $(0, 1), (1, 4)$ _____

6. y-intercept from $(0, 1), (1, 4)$ _____

7. Steeper: slope 4 or slope -6? _____

8. Faster increase: $y = 2x$ or $y = 10x$? _____

9. Greater slope: $y = x + 9$ or $y = 4x$? _____

10. y-intercept of a line through $(0, 7)$ _____

11. Slope of a horizontal line _____

12. Greater at $x = 1$: $y = 2x + 1$ or $y = x + 5$? _____

13. Slope from table x: $0, 1$, y: $2, 5$ _____

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 $y = x + 5$? _____

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Answer Keys

1. $y = 3x + 1$	**7.** slope -6	**13.** 3
2. $y = 2x + 4$	**8.** $y = 10x$	**14.** $y = 2x + 3$
3. 5	**9.** $y = 4x$	**15.** Plan B
4. -2	**10.** 7	**16.** Car B
5. 3	**11.** 0	**17.** $y = 8x + 20$
6. 1	**12.** $y = x + 5$	**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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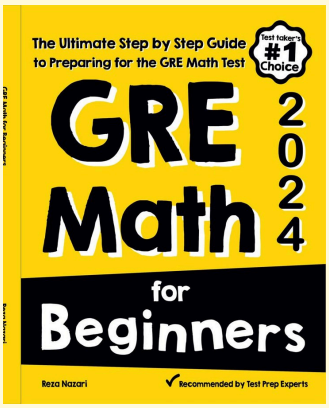

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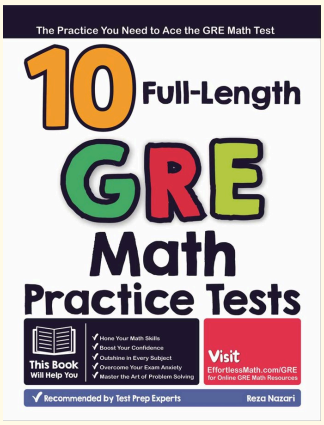

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