

Comparing Functions

Algebra 1 • Section 4.8

Name: _____

Date: _____

Score: _____ / 12

Quick Review and Helpful Hints

A function pairs each input with exactly one output. Pay attention to what the input means, what rule is being applied, and whether the question asks for a value, a rule, a domain, or an interpretation.

▷ **Example:** For $f(x) = 2x + 5$, find $f(4)$.

Work: Replace x with 4: $f(4) = 2(4) + 5 = 13$.

★ **Answer:** 13

◆ Practice Problems

Solve each problem. Show enough work that another student could follow your thinking.

- | | |
|--|--|
| <p>1. Compare $f(x) = 3x + 2$ and $g(x) = 5x - 4$. Which has greater rate of change? _____</p> | <p>6. Function A has slope -2; Function B has slope 1. Which is increasing? _____</p> |
| <p>2. Which has greater y-intercept: $y = 2x + 7$ or $y = 4x - 1$? _____</p> | <p>7. Compare $f(3)$ for $f(x) = x + 8$ and $g(x) = 4x - 1$. _____</p> |
| <p>3. At $x = 4$, compare $f(x) = 2x + 1$ and $g(x) = x^2 - 7$. _____</p> | <p>8. Compare $f(5)$ for $f(x) = 2x + 3$ and $g(x) = x^2 - 10$. _____</p> |
| <p>4. Which grows faster for large x: linear $4x + 9$ or exponential 2^x? _____</p> | <p>9. Which has smaller initial value: $a(x) = 10(1.2)^x$ or $b(x) = 3x + 7$? _____</p> |
| <p>5. A table increases by 6 when x increases by 2. Find the rate. _____</p> | <p>10. A graph crosses the y-axis at 6 and rises 2 per 1. Write a comparable linear rule. _____</p> |

◆ Word Problems

11. Plan A costs $20 + 4m$ and Plan B costs $12 + 6m$. Which is cheaper at $m = 3$?

12. Two savings plans are $S_1 = 50 + 10w$ and $S_2 = 20(1.2)^w$. Which starts larger?



Answer Keys

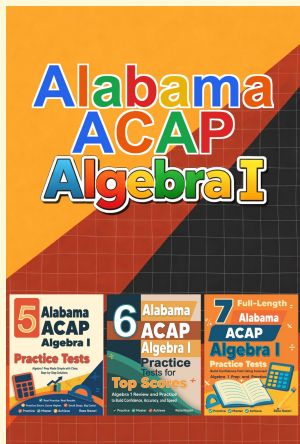
1. g
2. $y = 2x + 7$
3. They are equal
4. 2^x
5. 3
6. Function B
7. They are equal
8. $g(5)$ is greater
9. b
10. $y = 2x + 6$
11. Plan B
12. S_1

Step-by-Step Explanations

1. Rate of change is just the slope. Since 5 beats 3, g climbs faster.
2. The intercept is the lone number, where the line meets the y -axis: 7 outranks -1 .
3. Test both at 4: f gives 9 and g gives $16 - 7 = 9$ — a perfect tie.
4. Linear plods along steadily, but exponentials snowball and eventually blow right past it.
5. Rate is output change over input change, so 6 divided by 2 gives 3 per step.
6. A positive slope means the line heads uphill, so B's slope of 1 is the one rising.
7. At $x = 3$, f gives 11 and g gives $12 - 1 = 11$, so they meet right there.
8. Run both through 5: f reaches 13 while g edges ahead to 15.
9. Initial value lives at $x = 0$: a starts at 10, b starts at 7, so b begins lower.
10. Rising 2 per step is the slope and crossing at 6 is the intercept — snap them into $y = 2x + 6$.
11. At $m = 3$, Plan A rings up 32 and Plan B rings up 30, so B saves you money.
12. Set $w = 0$ to see the starting point: S_1 opens at 50 while S_2 opens at just 20.



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